AMITY UNIVERSITY RAJASTHAN

AMITY SCHOOL OF ENGINEERING & TECHNOLOGY

PROGRAM STRUCTURE

B. Tech. (Electrical & Electronics Engineering)

Program Code: BEE

Duration – 4 Years Full Time

2019 – 2023

Program Learning Outcomes (PLOs)

B.Tech. (Electrical & Electronics Engineering)

PLO 1 Ability to apply the knowledge of mathematics, science and engineering principles inElectrical and Electronics Engineering systems.

PLO 2 Ability to provide solutions for EEE problems by designing and conducting experiments, interpreting and analyzing data, and reporting the results.

PLO 3 Develop a comprehensive understanding of the entire range of electronic devices, analog and digital circuits with added state-of art knowledge on advanced electronic systems.

PLO 4 Ability to design different power electronic circuits and drives for industrial applications.

PLO 5 Develop an in-depth knowledge in transmission and distribution systems, power system analysis and protection systems to pursue a career in the power sector.

PLO 6 Ability ofa good knowledge in microprocessors/microcontrollers, data structures, computer programming and simulation software.

PLO 7 Ability to develop mathematical modelling, analysis and design of control systems and associated instrumentation for EEE.

PLO 8 Ability to design and build renewable energy systems for developing clean energy and sustainable technologies.

Credit Summary

Sem	Core course CC	Domain Electives DE	Values Added VAC	Open Electives	NTCC	Total
I	24	-	4	-	--	28
II	22	-	4	3	-	29
III	20	3	4	3	---	26
IV	16	3	4	3	---	26
V	12	3	4	3	6	28
VI	14	3	4	3	--	24
VII	15	-	4	3	3	25
VIII	6	3	--	--	12	21

SEMESTER I

Code	Course	Category	L	T	P	Credits
AM 101	Applied Mathematics – I	CC	3	1	-	4
AP 102	Applied Physics - I – Fields & Waves	CC	2	1		3
AC 103	Applied Chemistry	CC	2	1		3
BME 104	Element of Mechanical Engineering	CC	2	1		3
BCS 104	Introduction to Computers & Programming in C	CC	2	1		3
BEE 105	Basic Electrical Engineering	CC	2	1		3
Practical Courses						
AP 122	Applied Physics lab	CC	-	-	2	1
AC 123	Applied Chemistry lab	CC	-	-	2	1
BME 124	Element of Mechanical Engineering lab	CC	-	-	2	1
BCS 124	Programming in C lab	CC	-	-	2	1
BEE 125	Basic Electrical Engineering lab	CC	-	-	2	1
Value Added						
BCS 101	English	VA	1	-	-	1
BSS 104	Understanding Self For Effectiveness-I		1	-	-	1
FLT 101	French		2	-	-	2
FLG 101	German					
FLS 101	Spanish					
FLC 101	Chinese					
Total						**28**

SEMESTER II

Code	Course	Category	L	T	P	Credits
Core Courses						
AM 201	Applied Mathematics – II	CC	3	1	-	4
AP 202	Applied Physics - II – Modern Physics	CC	2	1		3
BCS 203	Object Oriented Programming using C++	CC	2	1		3
BME 204	Engineering Mechanics	CC	2	1		3
BME 205	Engineering Graphics	CC	1			1
EVS 001	Environmental Studies	CC	3	1	-	4
Practical Courses						
AP 222	Applied Physics - II – Modern Physics lab	CC	-	-	2	1
BCS 223	Object Oriented Programming using C++lab	CC	-	-	2	1
BME 224	Engineering Mechanics lab	CC	-	-	2	1
BME 225	Engineering Graphics lab	CC	-	-	2	1
Open Elective-I						
	OPEN ELECTIVE – I	OE	3	-	-	3
Value AddedCourses						
BCS 201	English	VA	1	-	-	1
BSS 204	Behavioral Science-II (Problem Solving & Creation thinking)	VA	1	-	-	1
FLT 201 FLG 201 FLS 201 FLC 201	Foreign Language – II French German Spanish Chinese	VA	2	-	-	2
Total						**29**

SEMESTER III

Code	Course	Category	L	T	P	Credit Units
Core Courses						
AM 301	Applied Mathematics - III	CC	3	-	-	3
BEC 302	Analog Electronics-I	CC	2	1	-	3
BEC 303	Circuits & Systems	CC	2	1	-	3
BEE 304	Electrical Machine-I	CC	2	1	-	3
BEC 305	Java Programming	CC	3	-	-	3
Practical Courses						
BEC 322	Analog Electronics-I Lab	CC	-	-	2	1
BEC 323	Circuits & Systems Lab	CC	-	-	2	1
BEE 324	Electrical Machine Lab-I	CC	-	-	2	1
BEC 325	Java Programming Lab	CC	-	-	2	1
Domain Electives: Student must select 1 course from following DE electives						
BEC 304	Signal & Systems	DE	2	1	-	3
BEC 307	Measurements & Instrumentation					
Open Elective 3		OE	-	-	-	3
Value addedCourses						
BCS 301	Communication Skills - I	VA	1	-	-	1
BSS 304	Behavioral Science-III (Interpersonal Communication)	VA	1	-	-	1
FLT 301	French	VA	2	-	-	2
FLG 301	German					
FLS 301	Spanish					
FLC 301	Chinese					
Total						**29**

SEMESTER IV

Code	Course	Category	L	T	P	Credit Units
Core Courses						
BEC401	Digital Circuits & Systems-I	CC	3	-	-	3
BEC 402	Analog Electronics-II	CC	3	-		3
BEE 403	Electric Machine - II	CC	2	1	-	3
BEE 404	Control System	CC	2	1	-	3
BEE 405	Power Plant Engineering	CC	1	1	-	2
Practical Courses						
BEE 421	Digital Circuits & Systems-I Lab	CC	-	-	2	1
BEC 422	Analog Electronics-II Lab	CC	-	-	2	1
BEE 423	Electric Machine Lab - II	CC	-	-	2	1
BEE 424	Control System Lab	CC	-	-	2	1
Domain Electives: Student must select 1 course from following DE electives						
BEC 406	Electromagnetic Field Theory	DE	2	-	-	3
BEE 406	Renewable Energy Technology					
Open Elective 3		OE	-	-	-	3
Value addedCourses						
BCS 401	Communication Skills - II	VA	1	-	-	1
BSS 404	Behavioral Science-IV (Relationship Management)	VA	1	-	-	1
	Foreign Language – IV	VA	2	-	-	2
FLT 401	French					
FLG 401	German					
FLS 401	Spanish					
FLC 401	Chinese					
Total						**28**

SEMESTER V

Code	Course	Category	L	T	P	Credit Units
Core Courses						
BEC 501	Microprocessor and Microcontroller Systems	CC	3	-	-	3
BEC 502	Digital Circuits & Systems-II	CC	2	1	-	3
BEE503	Modern & Digital Control Engineering	CC	2	1	-	3
Practical Courses						
BEE 521	Microprocessor and Micro Controller Lab	CC	-	-	2	1
BEC522	Digital Circuits & Systems-II Lab	CC			2	1
BEE528	MATLAB theory and practices	CC	-	-	2	1
BEE 560	Practical Training (Evaluation)	CC	-	-	-	6
Domain Electives: Student must select 1 course from following DE electives						
BEE 505	Computer System Architecture	DE	2	1	-	3
BEE 507	Process Control Engineering					
Open Elective 4		OE	-	-	-	3
Value addedCourses						
BCS 501	Communication Skills - III	VA	1	-	-	1
BSS 504	Behavioral Science-V (Understanding self for effectiveness	VA	1	-	-	1
	Foreign Language – V	VA	2	-	-	2
FLT 501	French					
FLG 501	German					
FLS 501	Spanish					
FLC 501	Chinese					
Total						**28**

SEMESTER VI

Code	Course	Category	L	T	P	Credit Units
Core Courses						
BEE 601	Power Electronics	CC	3	-	-	3
BEE 602	Power System Analysis	CC	2	1	-	3
BEE 603	Transmission and Distribution System	CC	2	1	-	3
BEE 604	Utilization of Electric Power	CC	3	-	-	3
Practical Courses						
BEE 621	Power Electronics Lab	CC	-	-	2	1
BEE 622	Power System Lab	CC	-	-	2	1
Domain Electives: Student must select 1 course from following DE electives						
BEC 606	Data Structures and IT	DE	3	-	-	3
BEE 606	Switch Mode Power Supplies					
BEE 607	Electrical Machine Design					
Open elective 5		OE	-	-	-	3
Value AddedCourses						
BCS 601	Communication Skills - IV	VA	1	-	-	1
BSS 604	Understanding self for effectiveness - VI	VA	1	-	-	1
	Foreign Language – VI	VA	2	-	-	2
FLT 601	French					
FLG 601	German					
FLS 601	Spanish					
FLC 601	Chinese					
Total						**24**

SEMESTER VII

Course Code	Course	Category	L	T	P	Credit Units
Core Courses						
BEE 701	Power System Engineering	CC	2	1	-	3
BEE 702	High Voltage Engineering	CC	3	-	-	3
BEE 703	Power System Protection	CC	3	-	-	3
BEE 704	Substation Engineering	CC	2	1	-	3
Practical Courses						
BEE 721	Power System Engg Lab	CC	-	-	2	1
BEE 722	High Voltage Engineering Lab	CC	-	-	2	1
BEE 725	Electrical Simulation Lab	CC	-	-	2	1
BEE 760	Seminar	CC	-	-	-	3
Open Elective 6		OE	-	-	-	3
Value addedCourses						
BCS 701	Communication Skills – V	VA	1	-	-	1
BSS 704	Understanding self for effectiveness – VII	VA	1	-	-	1
	Foreign Language – VII	VA	2	-	-	2
FLT701	French					
FLG 701	German					
FLS 701	Spanish					
FLC 701	Chinese					
Total						**25**

SEMESTER VIII

Course Code	Course	Category	L	T	P	Credit Units
Core Courses						
BEE 801	Electrical Drives & Control	CC	2	1	-	3
BEE 802	Flexible AC Transmission Systems	CC	2	1	-	3
BEE 860	Major Project	CC	-	-	-	12
Domain Electives: Student must select 1 course from following DE electives						
BEE 803	Optimization Techniques and Algorithms	DE	2	1	-	3
BEE 804	Smart Grid Technology					
Total						**21**
Note: CC - Core Course, VA - Value Added Course, OE - Open Elective, DE - Domain Elective, FW - Field Work						
Total Credits						**210**

APPLIED MATHEMATICS – I

Course Code: AM 101 **CreditUnits: 04**

Course Objective:

The knowledge of Mathematics is necessary for a better understanding of almost all the Engineering and Science subjects. Here our intention is to make the students acquainted with the concept of basic topics from Mathematics, which they need to pursue their Engineering degree in different disciplines.

Course Contents:

Module I: Differential Calculus

Successive differentiation, Leibnitz's theorem (without proof), Mean value theorem, Taylor's theorem (proof), Remainder terms, Asymptote & Curvature, Partial derivatives, Chain rule, Differentiation of Implicit functions, Exact differentials, Tangents and Normals, Maxima, Approximations, Differentiation under integral sign, Jacobians and transformations of coordinates.

Module II: Integral Calculus

Fundamental theorems, Reduction formulae, Properties of definite integrals, Applications to length, area, volume, surface of revolution, improper integrals, Multiple Integrals-Double integrals, Applications to areas, volumes.

Module III: Ordinary Differential Equations

Formation of ODEs, Definition of order, degree & solutions, ODE of first order : Method of separation of variables, homogeneous and non homogeneous equations, Exactness & integrating factors, Linear equations & Bernoulli equations, General linear ODE of n^{th} order, Solution of homogeneous equations, Operator method, Method of undetermined coefficients, Solution of simple simultaneous ODE.

Module IV: Vector Calculus

Scalar and Vector Field, Derivative of a Vector, Gradient, Directional Derivative, Divergence and Curl and their Physical Significance, Arc Length, Tangent, Directional Derivative, Evaluation of Line Integral, Green's Theorem in Plane (without proof), Representation of Surfaces, Tangent Plane and Surface Normal, Surface Integral, Stoke's Theorem (without proof), Gauss Divergence Theorem (without proof).

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

Text:

- Differential Calculus by Shanti Narain
- Integral Calculus by Shanti Narain

References:

- Differential Equation by A.R. Forsyth
- Higher Engineering Mathematics by H.K. Dass

APPLIED PHYSICS - I - FIELDS AND WAVES

Course Code: AP 102 **CreditUnits: 03**

Course Objective:

Aim of this course is to introduce the students to fundamentals of graduate level physics, which form the basis of all applied science and engineering

Course Contents:

Module I: Oscillations & Waves Oscillations

Introduction to S.H.M. Damped Oscillations: Differential Equation and its solution, logarithmic decrement, Quality Factor, Different conditions of damping of harmonic oscillations. Forced oscillations: Amplitude and Frequency Response, Resonance, Sharpness of Resonance

Plane. Progressive Waves: Differential Equation and Solution, Superposition of Progressive Waves stationary waves. Ultrasonics: Generation and application of ultrasonicwaves.

Module II: Wave Nature of Light Interference:

Coherent Sources, Conditions of interference, Interference due to division of wavefront, Fresnels biprism Interference due to division of amplitude, Newton's rings, Interference due to thin films .Diffraction: Fresnel and Fraunhofer diffraction, Fraunhofer diffraction at a single slit, double slit, N Slits, Transmission grating, Rayleigh criterion and Resolving power of grating. Polarization: Birefringence, Nicol prism, Production and analysis of plane, circularly and elliptically polarized light, Half and quarter wave plates, Optical rotation, Polarimeter.

Module III: Electromagnetics

Scalar and vector fields, gradient of a scalar field, physical significance of gradient, equipotential surface. Line, surface and volume integrals, Divergence and curl of vector field and mathematical analysis physical significance, Electric flux, Gauss' law, Proof and Applications, Gauss divergence and Stokes theorems.

Differential form of Gauss' Law, Amperes' Law, Displacement current, Faradays Law, Maxwell equations in free space & isotropic media (Integral form & differential form), EM wave propagation in free space, Poynting vector.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text

- Waves & oscillation, A. P. French
- Physics of waves, W. C. Elmore & M. A. Heald
- Introduction to Electrodynamics, D. J. Griffith

Reference

- Electrodynamics, Gupta, Kumar & Singh
- Optics, A. K. Ghatak
- Engineering Physics, Satya Prakash

APPLIED CHEMISTRY

Course Code: AC 103 **CreditUnits: 03**

Course Objective:

Four basic sciences, Physics, Chemistry, Mathematics and Biology are the building blocks in engineering and technology. Chemistry is essential to develop analytical capabilities of students, so that they can characterize, transform and use materials in engineering and apply knowledge in their field. All engineering fields have unique bonds with chemistry whether it is Aerospace, Mechanical, Environmental and other fields the makeup of substances is always a key factor, which must be known. For electronics and computer science engineering, apart from the material, computer modeling and simulation knowledge can be inherited from the molecule designing. The upcoming field of technology like Nanotechnology and Biotechnology depends fully on the knowledge of basic chemistry. With this versatile need in view, course has been designed in such a way so that the student should get an overview of the whole subject.

Course Contents:

Module I: Water Technology

Introduction and specifications of water, Hardness and its determination (EDTA method only), Alkalinity, Boiler feed water, boiler problems – scale, sludge, priming & foaming: causes & prevention, Boiler problems – caustic embitterment & corrosion: causes & prevention, Carbonate & phosphate conditioning, colloidal conditioning & calgon treatment Water softening processes: Lime – soda process, Ion exchange method, Water for domestic use.

Module II: Fuels

Classification, calorific value of fuel, (gross and net), Determination of calorific value of fuels, bomb calorimeter, Solid fuels - Proximate and ultimate analysis, Octane & Cetane No. and its significance. Numericals on combustion.

Module III: Instrumental Methods of analysis

Introduction; Principles of spectroscopy; Laws of absorbance IR : Principle, Instrumentation, Application UV : Principle, Instrumentation, Application NMR : Principle, Instrumentation, Application

Module III: Lubricants

Introduction; Mechanism of Lubrication; Types of Lubricants; Chemical structure related to Lubrication; Properties of lubricants; Viscosity and Viscosity Index; Iodine Value; Aniline Point; Emulsion number; Flash Point; Fire Point; Drop Point; Cloud Point; Pour Point. Selection of Lubricants.

Module VI: Corrosion

Introduction, Mechanism of dry and wet corrosion, Types of corrosion-Galvanic, Concentration cell, soil, pitting, intergranular, waterline. Passivity. Factors influencing corrosion. Corrosion control.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text:

- Engineering Chemistry- Jain and Jain
- Engineering Chemistry - Sunita Rattan
- Engineering Chemistry - Shashi Chawla

References:

- Engineering Chemistry – Dara and Dara
- Spectroscopy- Y.R Sharma
- Corrosion Engineering – Fontenna and Greene

ELEMENT OF MECHANICAL ENGINEERING

Course Code: BME 104 CreditUnits: 03

Course Objective:

The objective of this course is to impart the basic knowledge of thermodynamics, stress- strain, materials & their properties and various manufacturing processes to the students of all engineering discipline.

Course Contents:

Module I:Fundamental Concepts
Definition of thermodynamics, system, surrounding and universe, phase, concept of continuum, macroscopic & microscopic point of view, Thermodynamic equilibrium, property, state, path, process, cyclic process, Zeroth, first and second law of thermodynamics, Carnot Cycle, Introduction to I.C. Engines-two &four stoke S.I. and C.I. engines. Otto cycle. Diesel cycle.

Module II: Stress And Strain Analysis
Simple stress and strain: introduction, normal shear, and stresses-strain diagrams for ductile and brittle materials. Elastic constants, one-dimensional loadings of members of varying cross-section, Strain Energy, Properties of material-strength, elasticity, stiffness, malleability, ductility, brittleness, hardness and plasticity etc; Concept of stress and strain stress strain diagram, tensile test, impact test and hardness test.

Module III:Casting& Forging
Introduction of casting, pattern, mould making procedures, sand mould casting, casting defects, allowances of pattern. Forging-introduction, upsetting & drawing out, drop forging, press forging & m/c forging

Module IV: Welding & Sheet metal working
Introduction of welding processes, classification, gas welding, arc welding, resistance welding. Introduction to sheet metal shop, Shearing, trimming, blanking, piercing, shaving, notching, stretch forming, nibbling coining, embossing and drawing.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text
- Engineering thermodynamics, by P.K. Nag, Tata McGraw Hill.
- Thermal Engineering, by D.S. Kumar. S.K. Kataria and Sons.
- Thermal Engineering by PL Ballaney; Khanna Publishers, Delhi.
- Engineering Thermodynamics: Work and Heat Transfer, by Rogers and Mayhew, ELBS Publications

Reference
- Heine, R.W. C.R. Loper and P.C. Rosenthal, Principles of metal casting McGraw Hill
- Welding Technology by R.S. Parmar, Khanna Publishers.
- Thermodynamics and Heat Engines Volume-I, by R. Yadav: Central Publications.
- Ganesan, V. Internal Combustion Engine, Tata McGraw-Hill.
- Mathur, M.L. and Sharma, R.P. Internal Combustion Engine. Dhanpat Rai Publication

INTRODUCTION TO COMPUTERS AND PROGRAMMING IN C

Course Code: BCS 104 CreditUnits: 03

Course Objective:

The objective of this course module is to acquaint the students with the basics of computers system, its components, data representation inside computer and to get them familiar with various important features of procedure oriented programming language i.e. C.

Course Contents:

Module I: Introduction
Introduction to computer, history, von-Neumann architecture, memory system (hierarchy, characteristics and types), H/W concepts (I/O Devices), S/W concepts (System S/W & Application S/W, utilities). Data Representation: Number systems, character representation codes, Binary, octal, hexadecimal and their interconversions. Binary arithmetic, floating point arithmetic, signed and unsigned numbers, Memory storage unit.

Module II: Programming in C
History of C, Introduction of C, Basic structure of C program, Concept of variables, constants and data types in C, Operators and expressions: Introduction, arithmetic, relational, Logical, Assignment, Increment and decrement operator, Conditional, bitwise operators, Expressions, Operator precedence and associativity. Managing Input and output Operation, formatting I/O.

Module III: Fundamental Features in C
C Statements, conditional executing using if, else, nesting of if, switch and break Concepts of loops, example of loops in C using for, while and do-while, continue and break. Storage types (automatic, register etc.), predefined processor, Command Line Argument.

Module IV: Arrays and Functions
One dimensional arrays and example of iterative programs using arrays, 2-D arrays Use in matrix computations. Concept of Sub-programming, functions Example of user defined functions. Function prototype, Return values and their types, calling function, function argument, function with variable number of argument, recursion.

Module V: Advanced features in C
Pointers, relationship between arrays and pointers Argument passing using pointers, Array of pointers. Passing arrays as arguments. Strings and C string library. Structure and Union. Defining C structures, Giving values to members, Array of structure, Nested structure, passing strings as arguments. File Handling.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text:
- "ANSI C" by E Balagurusamy
- Yashwant Kanetkar, "Let us C", BPB Publications, 2nd Edition, 2001.
- Herbert Schildt, "C:The complete reference", Osbourne Mcgraw Hill, 4th Edition, 2002.
- V. Raja Raman, "Computer Programming in C", Prentice Hall of India, 1995.

References:
- **Kernighan & Ritchie, "C Programming Language", The (Ansi C Version), PHI, 2nd Edition.**
- **J. B Dixit, "Fundamentals of Computers and Programming in 'C'.**
- P.K. Sinha and Priti Sinha, "Computer Fundamentals", BPB publication.

BASIC ELECTRICAL ENGINEERING

Course Code: BEE 105 **CreditUnits: 03**

Course Objective:

The objective of the course is to provide a brief knowledge of Electrical Engineering to students of all disciplines. This Course includes some theorems related to electrical, some law's related to flow of current, voltages, basic knowledge of Transformer, basic knowledge of electromagnetism, basic knowledge of electrical network.

Course Contents:

Module I: Basic Electrical Quantities
Basic Electrical definitions-Energy, Power, Charge, Current, Voltage, Electric Field Strength, Magnetic Flux Density, etc., Resistance, Inductance and Capacitance. Ideal Source, Independent Source and Controlled Source

Module II: Network Analysis Techniques & Theorems
Circuit Principles: Ohm's Law, Kirchoff's Current Law, Kirchoff's Voltage Law Network Reduction: Star–Delta Transformation, Source Transformation, Nodal Analysis, Loop analysis. Superposition theorem Thevenin's Theorem, Norton's theorem and Reciprocity theorem.

Module III: Alternating Current Circuits
Peak, Average and RMS values for alternating currents, Power calculation: reactive power, active power, Complex power, power factor, impedance, reactance, conductance, susceptance Resonance: series Resonance, parallel resonance, basic definition of Q factor & Band-width.

Module IV: Transformers
Basic Transformer Operation principle, Construction, Voltage relations, Current relations, Linear circuit models, Open circuit test, Short circuit test, Transformer Efficiency.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text
- R.J. Smith, R.C. Dorf: Circuits, devices and Systems
- B.L. Thareja: Electrical Technology : Part -1 & 2

Reference
- V. Deltoro: Electrical Engineering fundamentals
- Schaum's Series: Electrical Circuits

APPLIED PHYSICS LAB - I

Course Code: AP 122 **CreditUnits: 01**

List of Experiments:

1. To determine the wavelength of sodium light by Newton's rings method.
2. To determine the dispersive power of the material of prism with the help of a spectrometer.
3. To determine the specific rotation of sugar by Bi-quartz or Laurent half shade polarimeter.
4. To determine the speed of ultrasonic waves in liquid by diffraction method.
5. To determine the width of a narrow slit using diffraction phenomena.
6. To determine the temperature coefficient of platinum wire, using a platinum resistance thermometer and a Callender & Griffth's bridge.
7. To determine the value of specific charge (ratio of e/m) of an electron by Thomson method.
8. To determine the internal resistance of Leclanche cell with the help of Potentiometer.
9. To determine the resistance per unit length of a Carey Foster's bridge wire and also to find out the specific resistance of a given wire.
10. To plot graph showing the variation of magnetic field with distance along the aixs of a circular coil carrying current, and hence estimate the radius of the coil.
11. To determine the value of acceleration due to gravity ('g') in the laboratory using bar pendulum.
12. To determine the moment of inertia of a flywheel about its own axis of rotation.
13. To determine the density of material of the given wire with the help of sonometer.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

APPLIED CHEMISTRY LAB

Course Code: AC 123 **Credit Units: 01**

List of Experiments:

1. To determine the ion exchange capacity of a given cation exchanger.
2. To determine the temporary, permanent and total hardness of a sample of water by complexometric titration method.
3. To determine the type and extent of alkalinity of given water sample.
4. To determine the number of water molecules of crystallization in Mohr's salt (ferrous ammonium sulphate) provided standard potassium dichromate solution (0.1N) using diphenylamine as internal indicator.
5. To determine the ferrous content in the supplied sample of iron ore by titrimetric analysis against standard $K_2Cr_2O_7$ solution using potassium ferricyanide $[K_3Fe(CN)_6]$ as external indicator.
6. (a) To determine the surface tension of a given liquid by drop number method.
   (b) To determine the composition of a liquid mixture A and B (acetic acid and water) by surface tension method.
7. To prepare and describe a titration curve for phosphoric acid – sodium hydroxide titration using pH-meter.
8. (a) To find the cell constant of conductivity cell.
   (b) Determine the strength of hydrochloric acid solution by titrating it against standard sodium hydroxide solution conductometrically
9. Determination of Dissolved oxygen in the given water sample.
10. To determine the total residual chlorine in water.
11. Determination of amount of oxalic acid and H_2SO_4 in 1 L of solution using N/10 NaOH and N/10 $KMnO_4$ solution.
12. Determination of viscosity of given oil by means of Redwood viscometer I.
13. To determine flash point and fire point of an oil by Pensky Martin's Apparatus
14. To determine the Iodine value of the oil.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ELEMENT OF MECHANICAL ENGINEERING LAB

Course Code: BME 124 **Credit Units: 01**

List of Experiments:

1. Welding

   (a) Arc Welding
   - Butt Joint
   - Lap Joint
   - T Joint

   (b) Gas Welding
   - Butt Joint
   - Lap Joint
   - Brazing of Broken pieces

2. Foundry
   - Sand mould casting by single piece pattern& Split pattern bracket with cores

3. Sheet Metal
   - Dust Bin
   - Mug
   - Funnel
   - Cylindrical Mug with handle-Rectangular

4. Fitting Shop
   - Male – Female Joint
   - Rectangular piece
   - Filing the job

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

PROGRAMMING IN C LAB

Course Code: **BCS 124** **Credit Units: 01**

Software Required: Turbo C

List of Experiments:

1. C program involving problems like finding the nth value of cosine series, Fibonacci series. Etc.
2. C programs including user defined function calls
3. C programs involving pointers, and solving various problems with the help of those.
4. File handling

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

BASIC ELECTRICAL ENGINEERING LAB

Course Code: BEE 125 **Credit Units: 01**

List of Experiments:

1. To verify KVL & KCL in the given network.
2. To verify Superposition Theorem.
3. To verify Maximum Power Transfer Theorem.
4. To verify Reciprocity Theorem.
5. To determine and verify R_{Th}, V_{Th}, R_N, I_N in a given network.
6. To perform open circuit & short circuit test on a single-phase transformer.
7. To study transient response of a given RLC Circuit.
8. To perform regulation, ratio & polarity test on a single-phase transformer.
9. To measure power & power factor in a three phase circuit by two wattmeter method.
10. To measure power & power factor in a three phase load using three ammeter & three voltmeter method.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ENGLISH

Course Code: BCS 101 **Credit Units: 01**

Course Objective:

The course is intended to give a foundation of English Language. The literary texts are indented to help students to inculcate creative & aesthetic sensitivity and critical faculty through comprehension, appreciation and analysis of the prescribed literary texts. It will also help them to respond form different perspectives.

Course Contents:

Module I: Vocabulary
Use of Dictionary
Use of Words: Diminutives, Homonyms & Homophones

Module II: Essentials of Grammar - I
Articles
Parts of Speech
Tenses

Module III: Essentials of Grammar - II
Sentence Structure
Subject -Verb agreement
Punctuation

Module IV: Communication
The process and importance
Principles & benefits of Effective Communication

Module V: Spoken English Communication
Speech Drills
Pronunciation and accent
Stress and Intonation

Module VI: Communication Skills - I
Developing listening skills
Developing speaking skills

Module VII: Communication Skills - II
Developing Reading Skills
Developing writing Skills

Module VIII: Written English communication
Progression of Thought/ideas
Structure of Paragraph
Structure of Essays

Module IX: Short Stories
Of Studies, by Francis Bacon
Dream Children, by Charles Lamb
The Necklace, by Guy de Maupassant
A Shadow, by R.K.Narayan
Glory at Twilight, Bhabani Bhattacharya

Module X: Poems

All the Worlds a Stage	Shakespeare
To Autumn	Keats
O! Captain, My Captain.	Walt Whitman
Where the Mind is Without Fear	Rabindranath Tagore
Psalm of Life	H.W. Longfellow

Examination Scheme:

Components	A	CT	HA	EE
Weightage (%)	05	15	10	70

Text & References:

Text

- Madhulika Jha, Echoes, Orient Long Man
- Ramon & Prakash, Business Communication, Oxford.

Reference

Sydney Greenbaum Oxford English Grammar, Oxford.

- Successful Communications, Malra Treece (Allyn and Bacon)
- Effective Technical Communication, M. Ashraf Rizvi.

BEHAVIOURAL SCIENCE - I
(UNDERSTANDING SELF FOR EFFECTIVENESS)

Course Code: BSS 104 **CreditUnits: 01**

Course Objective:

This course aims at imparting:

- Understanding self & process of self exploration
- Learning strategies for development of a healthy self esteem
- Importance of attitudes and its effective on personality
- Building Emotional Competence

Course Contents:

Module I: Self: Core Competency
Understanding of Self
Components of Self – Self identity
Self concept
Self confidence
Self image

Module II: Techniques of Self Awareness
Exploration through Johari Window
Mapping the key characteristics of self
Framing a charter for self
Stages – self awareness, self acceptance and self realization

Module III: Self Esteem & Effectiveness
Meaning and Importance
Components of self esteem
High and low self esteem
Measuring your self esteem

Module IV: Building Positive Attitude
Meaning and nature of attitude
Components and Types of attitude
Importance and relevance of attitude

Module V: Building Emotional Competence
Emotional Intelligence – Meaning, components, Importance and Relevance
Positive and Negative emotions
Healthy and Unhealthy expression of emotions

Module VI:End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Examination Scheme:

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

Text & References:

Text

- Organizational Behaviour, Davis, K.
- Hoover, Judhith D. Effective Small Group and Team Communication, 2002,Harcourt College Publishers
- Dick, Mc Cann & Margerison, Charles: Team Management, 1992 Edition, viva books
- Bates, A. P. and Julian, J.: Sociology - Understanding Social Behaviour
- Dressler, David and Cans, Donald: The Study of Human Interaction
- Lapiere, Richard. T – Social Change

Reference

- Lindzey, G. and Borgatta, E: Sociometric Measurement in the Handbook of Social Psychology, Addison – Welsley, US.
- Rose, G.: Oxford Textbook of Public Health, Vol.4, 1985.
- LaFasto and Larson: When Teams Work Best, 2001, Response Books (Sage), New Delhi
- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company
- Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College Publishers

FRENCH

Course Code: FLT 101 **Credit Units: 02**

Course Objective:

To familiarize the students with the French language

- with the phonetic system
- with the syntax
- with the manners
- with the cultural aspects

Course Contents:

Module A: pp. 01 to 37: Unités 1, 2, Unité 3 Objectif 1, 2
Only grammar of Unité 3: objectif 3, 4 and 5

Contenu lexical:Unité 1 : Découvrir la langue française : (oral et écrit)

1. se présenter, présenter quelqu'un, faire la connaissance des autres, formules de politesse, rencontres
2. dire/interroger si on comprend
3. Nommer les choses

Unité 2: Faire connaissance

1. donner/demander des informations sur une personne, premiers contacts, exprimer ses goûts et ses préférences
2. Parler de soi: parler du travail, de ses activités, de son pays, de sa ville.

Unité 3:Organiser son temps

1. dire la date et l'heure

Contenu grammatical:

1. organisation générale de la grammaire
2. article indéfini, défini, contracté
3. nom, adjectif, masculin, féminin, singulier et pluriel
4. négation avec « de », "moi aussi", "moi non plus"
5. interrogation : Inversion, est-ce que, qui, que, quoi, qu'est-ce que, où, quand, comment, quel(s), quelle(s)
   Interro-négatif : réponses : oui, si, non
6. pronom tonique/disjoint- pour insister après une préposition
7. futur proche

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre : Campus: Tome 1

GERMAN

Course Code: FLG 101 Credit Units: 02

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

Course Contents:

Module I: Introduction
Self introduction: heissen, kommen, wohnwn, lernen, arbeiten, trinken, etc.
All personal pronouns in relation to the verbs taught so far.
Greetings: Guten Morgen!, Guten Tag!, Guten Abend!, Gute Nacht!, Danke sehr!, Danke!, Vielen Dank!, (es tut mir Leid!),
Hallo, wie geht's?: Danke gut!, sehr gut!, prima!, ausgezeichnet!,
Es geht!, nicht so gut!, so la la!, miserabel!

Module II: Interviewspiel
To assimilate the vocabulary learnt so far and to apply the words and phrases in short dialogues in an interview – game for self introduction.

Module III: Phonetics
Sound system of the language with special stress on Dipthongs

Module IV: Countries, nationalities and their languages
To make the students acquainted with the most widely used country names, their nationalitie and the language spoken in that country.

Module V: Articles
The definite and indefinite articles in masculine, feminine and neuter gender. All Vegetables, Fruits, Animals, Furniture, Eatables, modes of Transport

Module VI: Professions
To acquaint the students with professions in both the genders with the help of the verb "sein".

Module VII: Pronouns
Simple possessive pronouns, the use of my, your, etc.
The family members, family Tree with the help of the verb "to have"

Module VIII: Colours
All the color and color related vocabulary – colored, colorful, colorless, pale, light, dark, etc.

Module IX: Numbers and calculations – verb "kosten"
The counting, plural structures and simple calculation like addition, subtraction, multiplication and division to test the knowledge of numbers.
"Wie viel kostet das?"

Module X: Revision list of Question pronouns
W – Questions like who, what, where, when, which, how, how many, how much, etc.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

Text
- Wolfgang Hieber, Lernziel Deutsch

- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer

Reference

- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH

Course Code: FLS 101 **Credit Units: 02**

Course Objective:

To enable students acquire the relevance of the Spanish language in today's global context, how to greet each other. How to present / introduce each other using basic verbs and vocabulary

Course Contents:

Module I
A brief history of Spain, Latin America, the language, the culture…and the relevance of Spanish language in today's global context.
Introduction to alphabets

Module II
Introduction to '*Saludos*' (How to greet each other. How to present / introduce each other).
Goodbyes (despedidas)
The verb *llamarse* and practice of it.

Module III
Concept of Gender and Number
Months of the years, days of the week, seasons. Introduction to numbers 1-100, Colors, Revision of numbers and introduction to ordinal numbers.

Module IV
Introduction to *SER* and *ESTAR* (both of which mean To Be).Revision of '*Saludos*' and '*Llamarse*'. Some adjectives, nationalities, professions, physical/geographical location, the fact that spanish adjectives have to agree with gender and number of their nouns. Exercises highlighting usage of *Ser* and *Estar*.

Module V
Time, demonstrative pronoun (Este/esta, Aquel/aquella etc)

Module VI
Introduction to some key AR /ER/IR ending regular verbs.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

Text
- Español, En Directo I A

Reference
- Español Sin Fronteras

CHINESE

Course Code: FLC 101 Credit Units: 02

Course Objective:

There are many dialects spoken in China, but the language which will help you through wherever you go is Mandarin, or Putonghua, as it is called in Chinese. The most widely spoken forms of Chinese are Mandarin, Cantonese, Gan, Hakka, Min, Wu and Xiang. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I
Show pictures, dialogue and retell.
Getting to know each other.
Practicing chart with Initials and Finals. (CHART – The Chinese Phonetic Alphabet Called "Hanyu Pinyin" in Mandarin Chinese.)
Practicing of Tones as it is a tonal language.
Changes in 3rd tone and Neutral Tone.

Module II
Greetings
Let me Introduce
The modal particle "ne".
Use of Please 'qing" – sit, have tea …….. etc.
A brief self introduction – Ni hao ma? Zaijian!
Use of "bu" negative.

Module III
Attributives showing possession
How is your Health? Thank you
Where are you from?
A few Professions like – Engineer, Businessman, Doctor, Teacher, Worker.
Are you busy with your work?
May I know your name?

Module IV
Use of "How many" – People in your family?
Use of "zhe" and "na".
Use of interrogative particle "shenme", "shui", "ma" and "nar".
How to make interrogative sentences ending with "ma".
Structural particle "de".
Use of "Nin" when and where to use and with whom. Use of guixing.
Use of verb "zuo" and how to make sentences with it.

Module V
Family structure and Relations.
Use of "you" – "mei you".
Measure words
Days and Weekdays.
Numbers.
Maps, different languages and Countries.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- "Elementary Chinese Reader Part I" Lesson 1-10

APPLIED MATHEMATICS – II

Course Code: AM 201 Credit Units: 04

Course Objective:

The knowledge of Mathematics is necessary for a better understanding of almost all the Engineering and Science subjects. Here our intention is to make the students acquainted with the concept of basic topics from Mathematics, which they need to pursue their Engineering degree in different disciplines.

Course Contents:

Module I: Linear Algebra

Hermitian and Skew Hermitian Matrix, Unitary Matrix, Orthogonal Matrix, Elementary Row Transformation, Reduction of a Matrix to Row Echelon Form, Rank of a Matrix, Consistency of Linear Simultaneous Equations, Gauss Elimination Method, Gauss-Jordan Method, Eigen Values and Eigen Vectors of a Matrix, Caley-Hamilton Theorem, Diagonalization of a Matrix, Vector Space, Linear Independence and Dependence of Vectors, Linear Transformations.

Module II: Infinite Series

Definition of Sequence, Bounded Sequence, Limit of a Sequence, Series, Finite and Infinite Series, Convergence and Divergence of Infinite series, Cauchy's Principle of Convergence, Positive Term Infinite Series, Comparison test, D'Alembert's Ratio test. Raabe's Test, Cauchy's nth root Test. Logarithmic Test, Alternating Series, Leibnitz's Test, Absolute and conditioinal convergence, Uniform Convergence, Power Series and its Interval of Convergence.

Module III: Complex Analysis

De Moivre's Theorem and Roots of Complex Numbers, Logarithmic Functions, Circular, Hyperbolic Functions and their Inverses.

Functions of a Complex Variables, Limits, Continuity and Derivatives, Analytic Function, Cauchy-Riemann Equations (without proof), Harmonic Function, Harmonic Conjugates, Conformal Mapping, Bilinear Transformations, Complex Line Integral, Cauchy Integral Theorem, Cauchy Integral Formula, Derivative of Analytic Function, Power Series, Taylor Series, Laurent Series, Zeroes and Singularities, Residues, Residue Theorem, Evaluation of Real Integrals of the Form $\int_0^{2\pi} F(\cos\theta, \sin\theta)\, d\theta$ and $\int_{-\infty}^{\infty} \frac{f(x)}{F(x)}\, dx$.

Module IV: Statistics and Probability

Moments, Skewness, Kurtosis, Random Variables and Probability Distribution, Mean and Variance of a Probability Distribution, Binomial Distribution, Poisson Distribution and Normal Distribution.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text

- Engineering Mathematics by Erwin Kreyszig.
- Engineering Mathematics by R.K. Jain and S.R.K. Iyengar.
- Higher Engineering Mathematics by H.K. Dass.

Reference

- Engineering Mathematics by B.S. Grewal.
- Differential Calculus by Shanti Narain.
- Integral Calculus by Shanti Narain.
- Linear Algebra- Schaum Outline Series.

APPLIED PHYSICS - II - MODERN PHYSICS

Course Code: AP 202 **Credit Units: 03**

Course Objective:

Aim of this course is to introduce the students to fundamentals of graduate level physics which form the basis of all applied science and engineering

Course Contents:

Module I: Special Theory of Relativity

Michelson-Morley experiment, Importance of negative result, Inertial & non-inertial frames of reference, Einstein's postulates of Special theory of Relativity, Space-time coordinate system, Relativistic Space Time transformation (Lorentz transformation equation), Transformation of velocity, Addition of velocities, Length contraction and Time dilation, Mass-energy equivalence (Einstein's energy mass relation) & Derivation of Variation of mass with velocity,

Module II: Wave Mechanics

Wave particle duality, De-Broglie matter waves, phase and group velocity, Heisenberg uncertainty principle, wave function and its physical interpretation, Operators, expectation values. Time dependent & time independent Schrödinger wave equation for free & bound states, square well potential (rigid wall), Step potential.

Module III: Atomic Physics

Vector atom model, LS and j-j coupling, Zeceman effect (normal & anomalous), Paschen-Bach effect, X-ray spectra and energy level diagram, Moseleys Law, Lasers – Einstein coefficients, conditions for light amplification, population inversion, optical pumping, three level and four level lasers, He-Ne and Ruby laser, Properties and applications of lasers.

Module IV: SolidState Physics

Sommerfield's free electron theory of metals, Fermi energy, Introduction to periodic potential & Kronig-Penny model (Qualitative) Band Theory of Solids, Semi-conductors: Intrinsics and Extrinsic Semiconductors, photoconductivity and photovotaics, Basic aspects of Superconductivity, Meissner effect.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text

- Concept of Modern Physics, A. Beiser
- Applied Physics II, Agarawal & Goel

Reference

- Solid State Physics, S. O. Pallai
- Physics of Atom, Wehr & Richards

OBJECT ORIENTED PROGRAMMING USING C++

Course Code: BCS 203 CreditUnits: 03

Course Objective:

The objective of this module is to introduce object oriented programming. To explore and implement the various features of OOP such as inheritance, polymorphism, Exceptional handling using programming language C++. After completing this course student can easily identify the basic difference between the programming approaches like procedural and object oriented.

Course Contents:

Module I: Introduction

Review of C, Difference between C and C++, Procedure Oriented and Object Oriented Approach. Basic Concepts: Objects, classes, Principals like Abstraction, Encapsulation, Inheritance and Polymorphism. Dynamic Binding, Message Passing. Characteristics of Object-Oriented Languages. Introduction to Object-Oriented Modeling techniques (Object, Functional and Dynamic Modeling).

Module II: Classes and Objects

Abstract data types, Object & classes, attributes, methods, C++ class declaration, Local Class and Global Class, State identity and behaviour of an object, Local Object and Global Object, Scope resolution operator, Friend Functions, Inline functions, Constructors and destructors, instantiation of objects, Types of Constructors, Static Class Data, Array of Objects, Constant member functions and Objects, Memory management Operators.

Module III: Inheritance

Inheritance, Types of Inheritance, access modes – public, private & protected, Abstract Classes, Ambiguity resolution using scope resolution operator and Virtual base class, Aggregation, composition vs classification hiérarchies, Overriding inheritance methods, Constructors in derived classes, Nesting of Classes.

Module IV: Polymorphism

Polymorphism, Type of Polymorphism – Compile time and runtime, Function Overloading, Operator Overloading (Unary and Binary) Polymorphism by parameter, Pointer to objects, this pointer, Virtual Functions, pure virtual functions.

Module V: Strings, Files and Exception Handling

Manipulating strings, Streams and files handling, formatted and Unformatted Input output. Exception handling, Generic Programming – function template, class Template Standard Template Library: Standard Template Library, Overview of Standard Template Library, Containers, Algorithms, Iterators, Other STL Elements, The Container Classes, General Theory of Operation, Vectors.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text:

- A.R. Venugopal, Rajkumar, T. Ravishanker "Mastering C++", TMH, 1997
- R. Lafore, "Object Oriented Programming using C++", BPB Publications, 2004.
- "Object Oriented Programming with C++" By E. Balagurusamy.
- Schildt Herbert, "C++: The Complete Reference", Wiley DreamTech, 2005.

References:

- Parasons, "Object Oriented Programming with C++", BPB Publication, 1999.
- Steven C. Lawlor, "The Art of Programming Computer Science with C++", Vikas Publication, 2002.
- Yashwant Kanethkar, "Object Oriented Programming using C++", BPB, 2004

ENGINEERING MECHANICS

Course Code: BME 204 **Credit Units: 03**

Course Objective:

Objective of this course is to provide fundamental knowledge of force system and its effect on the behaviour of the bodies that may be in dynamic or in static state. It includes the equilibrium of different structures like beams, frames, truss etc and the force transfer mechanism in the different components of a body under given loading condition.

Course Contents:

Module I: Force system & Structure

Free body diagram, Equilibrium equations and applications. Plane truss, perfect and imperfect truss, assumption in the truss analysis, analysis of perfect plane trusses by the method of joints, method of section.

Module II:Friction

Static and Kinetic friction, laws of dry friction, co-efficient of friction, angle of friction, angle of repose, cone of friction, friction lock, efficiency of screw jack, transmission of power through belt

Module III: Distributed Force

Determination of center of gravity, center of mass and centroid by direct integration and by the method of composite bodies, mass moment of inertia and area moment of inertia by direct integration and composite bodies method, radius of gyration, parallel axis theorem, Pappus theorems and its application, polar moment of inertia.

Module IV: Work -Energy

Work energy equation, conservation of energy, Virtual work, impulse, momentum conservation, impact of bodies, co-efficient of restitution, loss of energy during impact, D'alembert principle

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text

- S.S. Bhavikatti, Engineering Mechanics, New Age International Ltd
- Timoshenko, Engineering Mechanics, McGraw Hill

Reference

- R. S. Khurmi, Engineering Mechanics, S. Chand Publication
- I. H. Shames & G. K. M. Rao, Engineering Mechanics, Pearson Education, 2006

ENGINEERING GRAPHICS

Course Code: BME 205 **Credit Units : 01**

Course Contents:

Module 1:
Scales & Curves:Representative factor, Plain Scales, Diagonal Scales, Comperative Scales and Scale of chords. Construction of ellipse, Parabola, Hyperbola, Cycloid, Epicycloid, Hypocycloid, Involutes and Spirals by various methods.

Module 2:
Projection of Points & Straight lines:Projection of points, Projection of straight lines. True inclinations and true length of straight lines.

Module 3:
Projection of planes and solids:Projection of circle, triangle, polygons, polyhedrons, pyramids, cylinders and cones in different positions.

Module 1:
Section of solids and Isometric projections:Section of right solids by normal and inclined planes, Orthographic projection, first angle & third angle projection. Isometric scale, Isometric axes, Isometric projection from orthographic drawing.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text

- Engineering Graphics – Basant Agrawal and Dr. C. M. Agrawal, Tata McGraw-Hill Publishing Company Ltd.
- Engineering Drawing – by N. D. Bhatt

Reference

- Engineering Drawing and Graphics – by Veenugopal
- Engineering Drawing – by T. Jeyopoovan

ENVIRONMENTAL STUDIES

Course Code: EVS 001 **Credit Units: 04**

Course Objective:

The term environment is used to describe, in the aggregate, all the external forces, influences and conditions, which affect the life, nature, behaviour and the growth, development and maturity of living organisms. At present a great number of environment issues, have grown in size and complexity day by day, threatening the survival of mankind on earth. A study of environmental studies is quite essential in all types of environmental sciences, environmental engineering and industrial management. The objective of environmental studies is to enlighten the masses about the importance of the protection and conservation of our environment and control of human activities which has an adverse effect on the environment.

Course Contents:

Module I: The multidisciplinary nature of environmental studies
Definition, scope and importance
Need for public awareness

Module II: Natural Resources
Renewable and non-renewable resources:
Natural resources and associated problems
Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

Module III: Ecosystems
Concept of an ecosystem
Structure and function of an ecosystem
Producers, consumers and decomposers
Energy flow in the ecosystem
Ecological succession
Food chains, food webs and ecological pyramids
Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem
b. Grassland ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)

Module IV: Biodiversity and its conservation
Introduction – Definition: genetic, species and ecosystem diversity
Biogeographical classification of India
Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and option values
Biodiversity at global, national and local levels
India as a mega-diversity nation
Hot-spots of biodiversity
Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts
Endangered and endemic species of India
Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

Module V: Environmental Pollution
Definition
Causes, effects and control measures of:

a. Air pollution

b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear pollution

Solid waste management: Causes, effects and control measures of urban and industrial wastes.
Role of an individual in prevention of pollution.
Pollution case studies.
Disaster management: floods, earthquake, cyclone and landslides.

Module VI: Social Issues and the Environment
From unsustainable to sustainable development
Urban problems and related to energy
Water conservation, rain water harvesting, watershed management
Resettlement and rehabilitation of people; its problems and concerns. Case studies.
Environmental ethics: Issues and possible solutions
Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
Wasteland reclamation
Consumerism and waste products
Environmental Protection Act
Air (Prevention and Control of Pollution) Act
Water (Prevention and control of Pollution) Act
Wildlife Protection Act
Forest Conservation Act
Issues involved in enforcement of environmental legislation
Public awareness

Module VII: Human Population and the Environment
Population growth, variation among nations
Population explosion – Family Welfare Programmes
Environment and human health
Human Rights
Value Education
HIV / AIDS
Women and Child Welfare
Role of Information Technology in Environment and Human Health
Case Studies

Module VIII: Field Work
Visit to a local area to document environmental assets-river / forest/ grassland/ hill/ mountain.
Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
Study of common plants, insects, birds
Study of simple ecosystems-pond, river, hill slopes, etc (Field work equal to 5 lecture hours)

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

Text & References:

Text

- Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
- Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 380 013, India
- Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
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Reference

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- Sharma B.K., 2001. Environmental Chemistry. Geol Publ. House, Meerut
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- Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science
- Trivedi R.K., Handbook of Environmental Laws, Rules Guidelines, Compliances and Standards, Vol I and II, Enviro Media (R)
- Trivedi R. K. and P.K. Goel, Introduction to air pollution, Techno-Science Publication (TB)
- Wanger K.D., 1998 Environnemental Management. W.B. Saunders Co. Philadelphia, USA 499p

APPLIED PHYSICS – II-MODERN PHYSICS LAB

Course Code: AP 222 **Credit Units: 01**

List of Experiments:

1. To determine the wavelength of prominent lines of mercury spectrum using plane transmission grating.
2. To determine the thickness of a given wire by Wedge method.
3. To determine the wavelength of He-Ne laser light using single slit.
4. To determine the frequency of an electrically maintained tunning fork by Melde's method.
5. To study the variation of magnetic field along the axis of Helmholtz coil and to find out reduction factor.
6. To draw the V – I characteristics of a forward and reverse bias PN junction diode.
7. To determine the frequency of AC mains using sonometer.
8. To determine the energy band-gap of Germanium crystal using four probes method.
9. To draw V – I characteristics of a photocell and to verify the inverse square law of radiation.
10. To determine the acceleration due to gravity ('g') using Keter's reversible pendulum.
11. To study the characteristics of photo voltaic cell (solar cell).

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

OBJECT ORIENTED PROGRAMMING USING C++ LAB

Course Code: BCS 223 **CreditUnits: 01**

Software Required: Turbo C++

List of Experiments:

1. Creation of objects in programs and solving problems through them.
2. Different use of private, public member variables and functions and friend functions.
3. Use of constructors and destructors.
4. Operator overloading
5. Use of inheritance in and accessing objects of different derived classes.
6. Polymorphism and virtual functions (using pointers).
7. File handling.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ENGINEERING MECHANICS LAB

Course Code: BME 224 Credit Units: 01

List of Experiments:

1. To verify the law of Force Polygon
2. To verify the law of Moments using Parallel Force apparatus. (Simply supported type)
3. To determine the co-efficient of friction between wood and various surface (like
4. Leather, Wood, Aluminum) on an inclined plane.
5. To find the forces in the members of Jib Crane.
6. To determine the mechanical advantage, Velocity ratio and efficiency of a screw jack.
7. To determine the mechanical advantage, Velocity ratio and Mechanical efficiency of the Wheel and Axle
8. To determine the MA, VR, η of Worm Wheel (2-start)
9. Verification of force transmitted by members of given truss.
10. To verify the law of moments using Bell crank lever
11. To find CG and moment of Inertia of an irregular body using Computation method

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ENGINEERING GRAPHICS LAB

Course Code: BME 225 **Credit Units: 01**

List of Experiments:

12. Sketching and drawing of scale & Curve.
13. Sketching and drawing of Cycloidal Curve.
14. Sketching and drawing of Involute & Spirals.
15. Sketching and drawing of points & line.
16. Sketching and drawing of projection of planes.
17. Sketching and drawing of projection of solids.
18. Sketching and drawing of intersection of surfaces.
19. Sketching and drawing of development of surfaces.
20. Sketching and drawing of orthographic and isometric projection.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ENGLISH

Course Code: BCS 201 **Credit Units: 01**

Course Objective:

The course is intended to give a foundation of English Language. The literary texts are indented to help students to inculcate creative & aesthetic sensitivity and critical faculty through comprehension, appreciation and analysis of the prescribed literary texts. It will also help them to respond form different perspectives.

Course Contents:

Module I: Vocabulary
Use of Dictionary
Use of Words: Diminutives, Homonyms & Homophones

Module II: Essentials of Grammar - I
Articles
Parts of Speech
Tenses

Module III: Essentials of Grammar - II
Sentence Structure
Subject -Verb agreement
Punctuation

Module IV: Communication
The process and importance
Principles & benefits of Effective Communication

Module V: Spoken English Communication
Speech Drills
Pronunciation and accent
Stress and Intonation

Module VI: Communication Skills - I
Developing listening skills
Developing speaking skills

Module VII: Communication Skills - II
Developing Reading Skills
Developing writing Skills

Module VIII: Written English communication
Progression of Thought/ideas
Structure of Paragraph
Structure of Essays

Module IX: Short Stories
Of Studies, by Francis Bacon
Dream Children, by Charles Lamb
The Necklace, by Guy de Maupassant
A Shadow, by R.K.Narayan
Glory at Twilight, Bhabani Bhattacharya

Module X: Poems

All the Worlds a Stage	Shakespeare
To Autumn	Keats
O! Captain, My Captain.	Walt Whitman
Where the Mind is Without Fear	Rabindranath Tagore
Psalm of Life	H.W. Longfellow

Examination Scheme:

Components	A	CT	HA	EE
Weightage (%)	05	15	10	70

Text & References:

Text

- Madhulika Jha, Echoes, Orient Long Man
- Ramon & Prakash, Business Communication, Oxford.

Reference

- Sydney Greenbaum Oxford English Grammar, Oxford.
- Successful Communications, Malra Treece (Allyn and Bacon)
- Effective Technical Communication, M. Ashraf Rizvi.

BEHAVIOURAL SCIENCE - II
(PROBLEM SOLVING AND CREATIVE THINKING)

Course Code: BSS 204 **CreditUnits: 01**

Course Objective:

To enable the students:

- Understand the process of problem solving and creative thinking.
- Facilitation and enhancement of skills required for decision-making.

Course Contents:

Module I: Thinking as a tool for Problem Solving
What is thinking: The Mind/Brain/Behaviour
Critical Thinking and Learning:
Making Predictions and Reasoning
Memory and Critical Thinking
Emotions and Critical Thinking
Thinking skills

Module II: Hindrances to Problem Solving Process
Perception
Expression
Emotion
Intellect
Work environment

Module III: Problem Solving
Recognizing and Defining a problem
Analyzing the problem (potential causes)
Developing possible alternatives
Evaluating Solutions
Resolution of problem
Implementation
Barriers to problem solving:
Perception
Expression
Emotion
Intellect
Work environment

Module IV: Plan of Action
Construction of POA
Monitoring
Reviewing and analyzing the outcome

Module V: Creative Thinking
Definition and meaning of creativity
The nature of creative thinking
Convergent and Divergent thinking
Idea generation and evaluation (Brain Storming)
Image generation and evaluation
Debating
The six-phase model of Creative Thinking: ICEDIP model

Module VI:End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Examination Scheme:

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

Text & References:

Text

- Michael Steven: How to be a better problem solver, Kogan Page, New Delhi, 1999
- Geoff Petty: How to be better at creativity; Kogan Page, New Delhi, 1999
- Richard Y. Chang and P. Keith, Kelly: Wheeler Publishing, New Delhi, 1998.
- Phil Lowe Koge Page: Creativity and Problem Solving, New Delhi, 1996

Reference

- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 3, Management (1996); Pfeiffer & Company
- Bensley, Alan D.: Critical Thinking in Psychology – A Unified Skills Approach, (1998), Brooks/Cole Publishing Company.

FRENCH

Course Code: FLT 201 Credit Units: 02

Course Objective:

To enable the students to overcome the fear of speaking a foreign language and take position as a foreigner speaking French.

To make them learn the basic rules of French Grammar.

Course Contents:

Module A: pp.38 – 47: Unité 3 : Objectif 3, 4, 5. 6

Module B: pp. 47 to 75 Unité 4, 5

Contenu lexical: Unité 3: Organiser son temps

1. donner/demander des informations sur un emploi du temps, un horaire SNCF – Imaginer un dialogue
2. rédiger un message/ une lettre pour …
   i) prendre un rendez-vous/ accepter et confirmer/ annuler
   ii) inviter/accepter/refuser
3. Faire un programme d'activités

imaginer une conversation téléphonique/un dialogue

Propositions- interroger, répondre

Unité 4:Découvrir son environnement

1. situer un lieu
2. s'orienter, s'informer sur un itinéraire.
3. Chercher, décrire un logement
4. connaître les rythmes de la vie

Unité 5 : s'informer

1. demander/donner des informations sur un emploi du temps passé.
2. donner une explication, exprimer le doute ou la certitude.
3. découvrir les relations entre les mots
4. savoir s'informer

Contenu grammatical:

1. Adjectifs démonstratifs
2. Adjectifs possessifs/exprimer la possession à l'aide de : i. « de » ii. A+nom/pronom disjoint
3. Conjugaison pronominale – négative, interrogative - construction à l'infinitif
4. Impératif/exprimer l'obligation/l'interdiction à l'aide de « il faut…. »/ «il ne faut pas… »
5. passé composé
6. Questions directes/indirectes

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- **le livre à suivre : Campus: Tome 1**

GERMAN

Course Code: FLG 201 Credit Units: 02

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany. Introduction to Grammar to consolidate the language base learnt in Semester I

Course Contents:

Module I: Everything about Time and Time periods
Time and times of the day.
Weekdays, months, seasons.
Adverbs of time and time related prepositions

Module II: Irregular verbs
Introduction to irregular verbs like to be, and others, to learn the conjugations of the same, (fahren, essen, lessen, schlafen, sprechen und ähnliche).

Module III: Separable verbs
To comprehend the change in meaning that the verbs undergo when used as such
Treatment of such verbs with separable prefixes

Module IV: Reading and comprehension
Reading and deciphering railway schedules/school time table
Usage of separable verbs in the above context

Module V: Accusative case
Accusative case with the relevant articles
Introduction to 2 different kinds of sentences – Nominative and Accusative

Module VI: Accusative personal pronouns
Nominative and accusative in comparison
Emphasizing on the universal applicability of the pronouns to both persons and objects

Module VII: Accusative prepositions
Accusative propositions with their use
Both theoretical and figurative use

Module VIII: Dialogues
Dialogue reading: 'In the market place'
'At the Hotel'

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH

Course Code: FLS 201 **Credit Units: 02**

Course Objective:

To enable students acquire more vocabulary, grammar, Verbal Phrases to understand simple texts and start describing any person or object in Simple Present Tense.

Course Contents:

Module I
Revision of earlier modules.

Module II
Some more AR/ER/IR verbs. Introduction to root changing and irregular AR/ER/IR ending verbs

Module III
More verbal phrases (eg, Dios Mio, Que lastima etc), adverbs *(bueno/malo, muy, mucho, bastante, poco).*
Simple texts based on grammar and vocabulary done in earlier modules.

Module IV
Possessive pronouns

Module V
Writing/speaking essays like my friend, my house, my school/institution, myself….descriptions of people, objects etc, computer/internet related vocabulary

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras

CHINESE

Course Code: FLC 201 **Credit Units: 02**

Course Objective:

Chinese is a tonal language where each syllable in isolation has its definite tone (flat, falling, rising and rising/falling), and same syllables with different tones mean different things. When you say, "ma" with a third tone, it mean horse and "ma" with the first tone is Mother. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I
Drills
Practice reading aloud
Observe Picture and answer the question.
Tone practice.
Practice using the language both by speaking and by taking notes.
Introduction of basic sentence patterns.
Measure words.
Glad to meet you.

Module II
Where do you live?
Learning different colors.
Tones of "bu"
Buying things and how muchit costs?
Dialogue on change of Money.
More sentence patterns on Days and Weekdays.
How to tell time. Saying the units of time in Chinese. Learning to say useful phrases like – 8:00, 11:25, 10:30 P.M. everyday, afternoon, evening, night, morning 3:58, one hour, to begin, to end ….. etc.
Morning, Afternoon, Evening, Night.

Module III
Use of words of location like-li, wais hang, xia
Furniture – table, chair, bed, bookshelf,.. etc.
Description of room, house or hostel room.. eg what is placed where and how many things are there in it?
Review Lessons – Preview Lessons.
Expression 'yao", "xiang" and "yaoshi" (if).
Days of week, months in a year etc.
I am learning Chinese. Is Chinese difficult?

Module IV
Counting from 1-1000
Use of "chang-chang".
Making an Inquiry – What time is it now? Where is the Post Office?
Days of the week. Months in a year.
Use of Preposition – "zai", "gen".
Use of interrogative pronoun – "duoshao" and "ji".
"Whose"??? Sweater etc is it?
Different Games and going out for exercise in the morning.

Module V
The verb "qu"
- Going to the library issuing a book from the library
- Going to the cinema hall, buying tickets
- Going to the post office, buying stamps
- Going to the market to buy things.. etc
- Going to the buy clothes …. Etc.

Hobby. I also like swimming.
Comprehension and answer questions based on it.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- “Elementary Chinese Reader Part I” Lesson 11-20

APPLIED MATHEMATICS – III

Course Code: AM 301 **Credit Units: 03**

Course Objective:

The knowledge of Mathematics is necessary for a better understanding of almost all the Engineering and Science subjects. Here our intention is to make the students acquainted with the concept of basic topics from Mathematics, which they need to pursue their Engineering degree in different disciplines.

Course Contents:

Module I: Partial Differential Equations

Formation of PDEs, Solutions of a PDE, Equations solvable by direct integration, Linear equations of the first order, Non-linear equations of the first order, Charpit's method, Homogeneous linear equations with constant coefficients, Non homogeneous linear equations.

Module II: Fourier series and Harmonic Analysis

Euler's formulae, Conditions for a Fourier expansion, Functions having points of discontinuity, Change of interval, Odd and even functions – expansions of odd or even periodic functions, Half-range series, Parseval's formula, Complex form of Fourier series, Practical Harmonic analysis.

Module III: Laplace Transformation

Definition, Transforms of elementary functions, Properties of Laplace transforms, Existence conditions, Transforms of derivatives, Transforms of integrals, Evaluation of integrals by Laplace transform, Inverse transforms, Other methods of finding inverse transforms, Convolution theorem, Application to differential equations, Simultaneous linear equations with constant coefficients, Unit step functions, Periodic functions.

Module IV: Linear Programming

Formulation of the problem, Graphical method, Canonical and standard forms of L.P.P. Simplex method, Artificial variable techniques- M-method, Two phase method, Degeneracy, Dual simplex method.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

Text:

- Higher Engineering Mathematics by H.K. Dass

References:

- Partial Differential Equations by I. N. Snedon
- Laplace Transformation Schaum outline series
- Advance Engineering Mathematics – Kreszig
- Linear Programming – Hadley

ANALOG ELECTRONICS – I

Course Code: BEC 302 **Credit Units: 03**

Course Objective:

This course builds from basic knowledge of Semiconductor Physics to an understanding of basic devices and their models. This course builds a foundation for courses on VLSI design and analog CMOS IC Design.

Course Contents:

Module I: Semiconductor Diode and Diode Circuits

Drift, Diffusion, Poisson's equation, Solution for E and V and their plots for pn junction, Different types of diodes: Zener, Schottky, LED. Zener as voltage regulator, Diffusion capacitance, Drift capacitance, the load line concept, half wave, full wave rectifiers, clipping and clamping circuits.

Module II: Bipolar Junction Transistor

Bipolar junction transistor: Introduction, Transistor, construction, transistor operations, BJT characteristics, load line, operating point, leakage currents, saturation and cut off mode of operations.
Bias stabilization: Need for stabilization, fixed Bias, emitter bias, self bias, bias stability with respect to variations in $I_{co,}$ V_{BE} &β, Stabilization factors, thermal stability.

Module III: Small signal Analysis of transistor and Multistage Amplifier

Hybrid model for transistors at low frequencies, Analysis of transistor amplifier using h parameters, emitter follower, Miller's theorem, THE CE amplifier with an emitter resistance, Hybrid π model, Hybrid π Conducatnces and Capacitances, CE short circuit current gain, CE short circuit current gain with R_L
Multistage amplifier: Cascading of Amplifiers, Coupling schemes(RC coupling and Transformer coupling)

Module IV: Field Effect Transistors

Field effect transistor (JFET, MOSFET): volt-ampere characteristics, small signal model –common drain, common source, common gate, operating point, MOSFET, enhancement and -depletion mode, Common source amplifier, Source follower

Module V: Feedback Amplifiers

Feedback concept, Classification of Feedback amplifiers, Properties of negative Feedback amplifiers, Impedance considerations in different Configurations, Examples of analysis of feedback Amplifiers.

Module VI: Power amplifiers

Power dissipation in transistors, difference with voltage amplifiers, Amplifier classification (Class A, Class B, Class C, Class AB) class AB push pull amplifier, collector efficiency of each, cross over distortion.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

Text

- Boylestad: Electronic Devices and Circuits

References

- Robert F. Pierret: Semiconductor Device Fundamentals
- Millman and Halkias: Electronic Devices and circuits

CIRCUITS & SYSTEMS

Course Code: BEC 303 **Credit Units: 03**

Course Objective:

The course intends to make the students proficient in analyzing circuits. At the completion of the course, the student should be able to construct and interpret block diagrams and signal flow graphs of control systems and to use basic methods of determining their stability.

Course Contents:

Module I: Graph Theory and Network equations

Graph of a network, Trees, Co-trees and loops, Cut set matrix, Tie set matrix, number of possible trees of a graph, duality, Loop Analysis and Node Analysis.

Module II: Analysis of circuits using classical Method

Time and Frequency domain analysis of RL, RC and RLC circuits, Linear constant coefficient differential equation.

Module III: Signals and Laplace Transforms

Unit step signal, Ramp signal, impulse signal, Laplace transformations and its properties, Gate function, Inverse Laplace transformations, Application of Laplace Transforms in circuit analysis.

Module IV: Network Theorems

Reciprocity theorem, Superposition theorem, Thevenin's and Norton's theorems, Millman's theorem, Maximum power transfer theorem, Compensation theorem, Tellegan's theorem.

Module V: Two port Network & Network Functions

Introduction, two port z-, y-, T-, h-parameters, Inter-relations among parameters, Condition for reciprocity and symmetry, Interconnections of two port networks, Driving point and transfer functions, Poles, Zeros and necessary condition for driving point and transfer function,.

Module VI: Network Synthesis

Hurwitz polynomial, Positive real functions, synthesis of LC, RC, RL immittance functions.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text:

- M.E. Valkenburg, "Network analysis", PHI.
- D. R. Choudhary, "Networks and Systems", New Age International.

- K.M. Soni, 2009, “Circuits and Systems”, VIII Edition, S.K. Kataria & Sons Delhi.

References:

- Bhise, Chadda, Kulshreshtha, “Engineering network analysis and filter design”, Umesh Publication.
- F.F. Kuo, “Network Analysis and Synthesis”, Wiley India Pvt. Ltd.

ELECTRIC MACHINE - I

Course Code: BEE 304 **Credit Units: 03**

Course Objective:

The purpose of this course is to introduce the student to the various types of basic machines used in the industry and its application.

Course Contents:

Module I: D. C. Machines

EMF and Torque equations, Armature windings, Armature Reaction, Demagnetizing and Cross-magnetizing armature MMF, Inter pole and compensating windings, commutation. Characteristics of D.C.generators. D.C. motors and their characteristics

Module II : DC MACHINE STARTERS AND SPEED CONTROL

Starting of D.C.motors. Starter step calculation for a D.C. shunt and series motor. Speed control of D.C. motors. Ward Leonard control. Braking of d.c.motors. Efficiency and testing of d.c. machines, Hopkinson test.

Module III:1- Ø Transformers

Transformer construction and practical considerations. Equivalent circuit, Exact and approximate, per unit values, Phasor diagram, Transformer testing: open circuit test, Short Circuit test, Sumpner's test, Efficiency and voltage regulation, All day efficiency, Auto-transformer.

Module IV:3 – Ø Transformer

Three-phase Bank of Single-phase Transformers, Parallel operations of 1 and 3 phase transformers, 3 to 2 and 6 phase conversion. Load division between transformers in parallel. Three winding transformers, Tertiary winding, Tap Changing, Transformers for special purpose, Welding, Traction, Instruments and pulse Transformers.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

Text*:*

- Electrical Machines: I. J. Nagrath and D. P. Kothari (Tata McGraw Hill)
- Electrical Machniery: Fitzerald, Kingsley (McGraw Hill)
- Electrical Machnies: P. C. Sen

JAVA PROGRAMMING

Course Code: BEC 305 **Credit Units: 03**

Course Objective:

The objective is to impart programming skills used in this object oriented language java. The course explores all the basic concepts of core java programming. The students are expected to learn it enough so that they can develop the web solutions like creating applets etc.

Course Contents:

Module I

Concepts of OOP, Features of Java, How Java is different from C++, Data types, Control Statements, identifiers, arrays, operators. Inheritance: Multilevel hierarchy, method overriding, Abstract classes, Final classes, String Class.

Module II

Defining, Implementing, Applying Packages and Interfaces, Importing Packages. Fundamentals, Types, Uncaught Exceptions, Multiple catch Clauses, Java's Built-in Exception.

Module III

Creating, Implementing and Extending thread, thread priorities, synchronization suspending, resuming and stopping Threads, Constructors, Various Types of String Operations. Exploring Various Basic Packages of Java: Java.lang, Java. util, Java.i.o

Module IV

Event handling Mechanism, Event Model, Event Classes, Sources of Events, Event Listener Interfaces
AWT: Working with Windows, AWT Controls, Layout Managers

Module V

AppletClass, Architecture, Skeleton, Display Methods.
Swings: Japplet, Icons, labels, Text Fields, Buttons, Combo Boxes.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

Text:

- JAVA The Complete Reference by Patrick Naughton & Herbert Schild, TMH
- Introduction to JAVA Programming a Primar, Balaguruswamy.

References:

- "Introduction to JAVA Programming" Daniel/Young PHI
- Jeff Frentzen and Sobotka, "Java Script", Tata McGraw Hill,1999

ANALOG ELECTRONICS LAB - I

Course Code: BEC 322 **Credit Units: 01**

Course Contents:

1. To study and plot the characteristics of a junction diode.
2. To study Zener diode I-V characteristics.
3. To study diode based clipping and clamping circuits.
4. To study half wave, full wave and bridge rectifier with filters.
5. To study the input and output characteristics of a transistor in its various configurations (CE and CB).
6. To study and plot the characteristics of a JFET in its various configurations.
7. To study and plot the characteristics of a MOSFET in its various configurations.
8. To study various types of Bias Stabilization for a transistor.
9. To study the gain and plot the frequency response of a single stage transistor amplifier.
10. To measure gain and plot the frequency response of double stage RC coupled amplifier.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

CIRCUITS AND SYSTEMS LAB

Course Code: BEC 323 **Credit Units: 01**

List of Experiments:

1. To determine the Fourier components of a square wave.
2. To determine the Fourier components of a clipped sine wave.
3. To verify Tellegen's Theorem in a given network.
4. To determine the Y- and Z parameters of a network.
5. To design series-series connections and determine its Z parameters.
6. To design parallel-parallel connections and determine its Y parameters.
7. To design series-parallel connections and determine its h parameters.
8. To design a cascade connection and determine its ABCD (transmission) parameters.
9. To determine the h parameters of a transistor in its various configurations.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ELECTRIC MACHINE LAB - I

Course Code: BEE 324 **Credit Units: 01**

List of Experiments:

1. Load test on a single phase transformer.
2. To perform Open circuit and short circuit tests on a single phase transformer and hence find equivalent circuit, voltage regulation and efficiency.
3. To find the efficiency and voltage regulation of single phase transformer under different loading conditions.
4. To perform parallel operation of two single phase transformers.
5. To study the various connections of three phase transformer.
6. To study the constructional details of D.C. machine and to draw sketches of different components.
7. To measure armature and field resistance of D.C. shunt generator and to obtain its open circuit characteristics.
8. To obtain load characteristics of D.C. shunt/series /compound generator.
9. To draw speed-torque characteristics of D.C. shunt/series /compound generator.
10. To study D.C. motor starters.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

JAVA PROGRAMMING LAB

Course Code: BEC 325 **Credit Units: 01**

Course Contents:

Software Required: JDK1.3

Assignments will be provided for the following:

- Java programs using classes & objects and various control constructs such as loops etc, and data structures such as arrays, structures and functions
- Java programs for creating Applets for display of images and texts.
- Programs related to Interfaces & Packages.
- Input/Output and random files programs in Java.
- Java programs using Event driven concept.
- Programs related to network programming.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

SIGNALS AND SYSTEMS

Course Code: BEC 304 **Credit Units: 03**

Course Objective:

The objective of the course is to provide knowledge of Signals and Systems to students of ECE. This Course includes good insight of types of signals and types of systems, various operations performed on them through the use of Fourier series, Fourier transform, z transform.

Course Contents:

Module I: Signals and Systems

Def. of signal, def. of system, classification of signal, continuous time and discrete time signals, operations performed on them, even and odd signals, periodic and non periodic signals, deterministic and random signals, energy signals, power signals, step, impulse, ramp functions, classification of systems.

Module II: LTI system

Impulse response, step response, convolution sum, convolution integral, continuous LTI, discrete LTI, properties of LTI system, LTI system described by differential and difference equation, interconnection of system.

Module III: Fourier series

Representation of continuous time periodic signal, properties of continuous time Fourier series, representation of discrete time periodic signals, properties of discrete time Fourier series.

Module IV: Fourier Transform

Continuous time Fourier transform, properties of continuous time Fourier transform, discrete time Fourier transform, properties of discrete time Fourier transform

Module V: Z-Transform

Region of convergence, first order system, second order system, inverse Z transform, analysis of LTI system using Z transform.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

- A.V Oppenheim, A.S Willsky: Signals and Systems
- Haykins: Signals and Systems

MEASUREMENTS & INSTRUMENTATION

Course Code: BEC 307 Credit Units: 03

Course Objective:

This course dealswith the systematic study of the electrical and electronics measurements, their basic features and types. This also describe the basic fundamental for characterizing all possible types of electrical and electronics measurements.

Module I :Basics of Measurement Systems:
General concepts and terminology of measurement systems, Basic characteristics of measuring devices, standards and calibration, Accuracy, Precision, Sensitivity, Resolution, Linearity & Errors in measurement.

Module II :PMMC Instruments:
PMMC meters- construction, torque equation, ammeter shunts, multirange ammeter, voltmeter multiplier, sensitivity, ohmmeters, multimeters; Construction & general equation of moving iron, electrodynamometer, hot wire instruments,

Module III: Measurement of Resistance, Inductance and Capacitance:
D.C. Bridges: Wheatstone's bridge, Sensitivity & Limitations; Carey Foster Bridge; Kelvin double bridge; Megaohm Bridge. A.C. Bridges: Maxwell's inductance Capacitance Bridge; Andersons Bridge; De Sauty's Bridge; Schering Bridge.

Module IV: Component Measuring Instruments:
Q meter, Vector Impedance meter, RF Power & Voltage Measurements, Introduction to shielding & grounding & Noise problem.

Module V: Cathode Ray Oscillioscope:
CRT Construction, Basic CRO circuits, CRO Probes, Basic functioning, Techniques of Measurement of Voltage, Current, Phase Angle and Frequency, , Multibeam, multi trace, storage & sampling Oscilloscopes.

EXAMINATION SCHEME:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

A: Attendance, CT: Class Test, S/V/Q: Seminar/Viva/Quiz, HA: Home Assignment, EE: End Semester Examination

Text &Reference books:

Text:

- A Course In Electrical & Electronic Measurement & Instrumentation, A.K.Sawhney, Dhanpat Rai

Reference

- Introduction To Measurements And Instrumentation, Arun K. Ghosh, PHI
- Electronic Measurements & Instrumentation, Bernard Oliver, John Cage, TMH
- Elements Of Electronic Instrumentation And Measurement, Carr, Pearson
- Electronic Instrumentation, H S Kalsi, TMH

COMMUNICATION SKILLS - I

Course Code: BCS 301 **Credit Units: 01**

Course Objective:

To form written communication strategies necessary in the workplace

Course Contents:

Module I: Introduction to Writing Skills

Effective Writing Skills
Avoiding Common Errors
Paragraph Writing
Note Taking
Writing Assignments

Module II: Letter Writing

Types
Formats

Module III

Memo
Agenda and Minutes
Notice and Circulars

Module IV: Report Writing

Purpose and Scope of a Report
Fundamental Principles of Report Writing
Project Report Writing
Summer Internship Reports

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Business Communication, Raman – Prakash, Oxford
- Creative English for Communication, Krishnaswamy N, Macmillan
- Textbook of Business Communication, Ramaswami S, Macmillan
- Working in English, Jones, Cambridge
- A Writer's Workbook Fourth edition, Smoke, Cambridge
- Effective Writing, Withrow, Cambridge
- Writing Skills, Coe/Rycroft/Ernest, Cambridge
- Welcome , Jones, Cambridge

BEHAVIOURAL SCIENCE - III
(INTERPERSONAL COMMUNICATION)

Course Code: BSS 304 **CreditUnits: 01**

Course Objective:

This course provides practical guidance on

- Enhancing personal effectiveness and performance through effective interpersonal communication
- Enhancing their conflict management and negotiation skills

Course Contents:

Module I: Interpersonal Communication: An Introduction

Importance of Interpersonal Communication
Types – Self and Other Oriented
Rapport Building – NLP, Communication Mode
Steps to improve Interpersonal Communication

Module II: Behavioural Communication

Meaning and Nature of behavioiural communication
Persuasion, Influence, Listening and Questioning
Guidelines for developing Human Communication skills
Relevance of Behavioural Communication for personal and professional development

Module III: Interpersonal Styles

Transactional Analysis
Life Position/Script Analysis
Games Analysis
Interactional and Transactional Styles

Module IV: Conflict Management

Meaning and nature of conflicts
Styles and techniques of conflict management
Conflict management and interpersonal communication

Module V: Negotiation Skills

Meaning and Negotiation approaches (Traditional and Contemporary)
Process and strategies of negotiations
Negotiation and interpersonal communication

Module VI:End-of-Semester Appraisal

Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Examination Scheme:

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

Text & References:

- Vangelist L. Anita, Mark N. Knapp, Inter Personal Communication and Human Relationships: Third Edition, Allyn and Bacon
- Julia T. Wood. Interpersonal Communication everyday encounter

- Simons, Christine, Naylor, Belinda: Effective Communication for Managers, 1997 1st Edition Cassel
- Goddard, Ken: Informative Writing, 1995 1st Edition, Cassell
- Harvard Business School, Effective Communication: United States of America
- Foster John, Effective Writing Skills: Volume-7, First Edition 2000, Institute of Public Relations (IPR)
- Beebe, Beebe and Redmond; Interpersonal Communication, 1996; Allyn and Bacon Publishers.

FRENCH - III

Course Code:FLT 301 **Credit Units: 02**

Course Objective:

To provide the students with the know-how

- To master the current social communication skills in oral and in written.
- To enrich the formulations, the linguistic tools and vary the sentence construction without repetition.

Course Contents:

Module B: pp. 76 – 88 Unité 6

Module C: pp. 89 to103 Unité 7

Contenu lexical: **Unité 6:se faire plaisir**

1. acheter : exprimer ses choix, décrire un objet (forme, dimension, poids et matières) payer
2. parler de la nourriture, deux façons d'exprimer la quantité, commander un repas au restaurant
3. parler des différentes occasions de faire la fête

Unité 7: Cultiver ses relations

1. maîtriser les actes de la communication sociale courante (Salutations, présentations, invitations, remerciements)
2. annoncer un événement, exprimer un souhait, remercier, s'excuser par écrit.
3. caractériser une personne (aspect physique et caractère)

Contenu grammatical:

1. accord des adjectifs qualificatifs
2. articles partitifs
3. Négations avec de, ne…rien/personne/plus
4. Questions avec combien, quel…
5. expressions de la quantité
6. ne…plus/toujours - encore
7. pronoms compléments directs et indirects
8. accord du participe passé (auxiliaire « avoir ») avec l'objet direct
9. Impératif avec un pronom complément direct ou indirect
10. construction avec « que » - Je crois que/ Je pense que/ Je sais que

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- **le livre à suivre : Campus: Tome 1**

GERMAN - III

Course Code: FLG 301 **Credit Units: 02**

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

Course Contents:

Module I: Modal verbs
Modal verbs with conjugations and usage
Imparting the finer nuances of the language

Module II: Information about Germany (ongoing)
Information about Germany in the form of presentations or "Referat"– neighbors, states and capitals, important cities and towns and characteristic features of the same, and also a few other topics related to Germany.

Module III: Dative case: Dative case, comparison with accusative case
Dative case with the relevant articles
Introduction to 3 different kinds of sentences – nominative, accusative and dative

Module IV: Dative personal pronouns : Nominative, accusative and dative pronouns in comparison

Module V: Dative prepositions : Dative preposition with their usage both theoretical and figurative use

Module VI: Dialogues : In the Restaurant, At the Tourist Information Office,A telephone conversation

Module VII: Directions : Names of the directions Asking and telling the directions with the help of a roadmap

Module VIII: Conjunctions : To assimilate the knowledge of the conjunctions learnt indirectly so far

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH – III

Course Code: FLS 301 **Credit Units: 02**

Course Objective:

To enable students acquire knowledge of the Set/definite expressions (idiomatic expressions) in Spanish language and to handle some Spanish situations with ease.

Course Contents:

Module I

Revision of earlier semester modules
Set expressions (idiomatic expressions) with the verb *Tener, Poner, Ir….*
Weather

Module II

Introduction to *Gustar*…and all its forms. Revision of *Gustar* and usage of it

Module III

Translation of Spanish-English; English-Spanish. Practice sentences.
How to ask for directions (using estar)
Introduction to IR + A + INFINITIVE FORM OF A VERB

Module IV

Simple conversation with help of texts and vocabulary
En el restaurante
En el instituto
En el aeropuerto

Module V

Reflexives

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras -Nivel El

CHINESE – III

Course Code: FLC 301 **Credit Units: 02**

Course Objective:

Foreign words are usually imported by translating the concept into Chinese, the emphasis is on the meaning rather than the sound. But the system runs into a problem because the underlying name of personal name is often obscure so they are almost always transcribed according to their pronciation alone. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I

Drills
Dialogue practice
Observe picture and answer the question.
Introduction of written characters.
Practice reading aloud
Practice using the language both by speaking and by taking notes.
Character writing and stroke order

Module II

Measure words
Position words e.g. inside, outside, middle, in front, behind, top, bottom, side, left, right, straight.
Directional words – beibian, xibian, nanbian, dongbian, zhongjian.
Our school and its different building locations.
What game do you like?
Difference between "hii" and "neng", "keyi".

Module III

Changing affirmative sentences to negative ones and vice versa
Human body parts.
Not feeling well words e.g. ; fever, cold, stomach ache, head ache.
Use of the modal particle "le"
Making a telephone call
Use of "jiu" and "cal" (Grammar portion)
Automobiles e.g. Bus, train, boat, car, bike etc.
Traveling, by train, by airplane, by bus, on the bike, by boat.. etc.

Module IV

The ordinal number "di"
"Mei" the demonstrative pronoun e.g. mei tian, mei nian etc.
use of to enter to exit
Structural particle "de" (Compliment of degree).
Going to the Park.
Description about class schedule during a week in school.
Grammar use of "li" and "cong".
Comprehension reading followed by questions.

Module V

Persuasion-Please don't smoke.
Please speak slowly
Praise – This pictorial is very beautiful
Opposites e.g. Clean-Dirty, Little-More, Old-New, Young-Old, Easy-Difficult, Boy-Girl, Black-White, Big-Small, Slow-Fast … etc.

Talking about studies and classmates
Use of “it doesn’t matter”
Enquiring about a student, description about study method.
Grammar: Negation of a sentence with a verbal predicate.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- “Elementary Chinese Reader Part I, Part-2” Lesson 21-30

DIGITAL CIRCUITS AND SYSTEMS – I

Course Code: BEC 401 **Credit Units: 03**

Course Objective:

This course is an introduction to the basic principles of digital electronics. At the conclusion of this course, the student will be able to quantitatively identify the fundamentals of computers, including number systems, logic gates, logic and arithmetic subsystems, and integrated circuits. They will gain the practical skills necessary to work with digital circuits through problem solving and hands on laboratory experience with logic gates, encoders, flip-flops, counters, shift registers, adders, etc. The student will be able to analyze and design simple logic circuits using tools such as Boolean Algebra and Karnaugh Mapping, and will be able to draw logic diagrams.

Course Contents:

Module I: Boolean Functions

Analog & digital signals, AND, OR, NOT, NAND, NOR, XOR & XNOR gates, Boolean algebra, DeMorgan's theorems, Implementation of logical function using only NAND/NOR gates, 1`s complement and 2`s complement, BCD to Gray and Gray to BCD code conversion, Standard representation of logical functions (SOP and POS forms), K-map representation and simplification of logical function up to five variables, don't care conditions, XOR & XNOR simplifications of K-maps, Tabulation method.

Module II: Combinational Circuits

Adders, Subtractors, Implementation of full adder using half adder, full subtractor using half subtractor, Multiplexer, de-multiplexer, decoder & encoder, code converters, 1 & 2 bit comparators, BCD to seven segment decoder/encoder, Implementation of logic functions using multiplexer/de-multiplexer and decoder, Implementation of 16×1 MUX using 4×1 MUX, 4×16 decoder using 3×8 decoder etc., logic implementations using PROM, PLA & PAL.

Module III: Sequential Circuits

Difference between combinational and sequential circuits, Latch, Flip-flops: SR, JK, D & T flip flops – Truth table, Excitation table, Conversion of flip-flops, set up and hold time, race around condition, Master Slave flip flop, Shift registers: SIPO, PISO, PIPO, SIPO, Bi-directional, 4-bit universal shift register; Counters: Asynchronous/ripple & synchronous counters – up/down, Ring counter, sequence detector.

Module IV: Logic families & data converters

Logic families: Special characteristics (Fan out, Power dissipation, propagation delay, noise margin), working of RTL, DTL, TTL, ECL and CMOS families; Data converters: Special characteristics, ADC – successive approximation, linear ramp, dual slope; DAC – Binary Weighted, R-2R ladder type.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

- Moris Mano: Digital Design, Pearson Education.
- R. P. Jain: Digital Electronics, Tata McGraw Hill.
- Thomas L. Floyd: Digital Fundamentals, Pearson Education.
- Malvino and Leech: Digital Principles & Applications, Tata McGraw Hill.

ANALOG ELECTRONICS – II

Course Code: BEC 402 **Credit Units: 03**

Course Objective:

The purpose of this course is to introduce the student to the application of semiconductor devices in linear analog circuits. To insure the usefulness of the course material to both computer engineers and electrical engineers, the course stresses circuit designs using the operational amplifier.

Course Contents:

Module I: Building Blocks of Analog ICs

Differential amplifier, Op-amp Model, op-amp DC & AC parameters, virtual ground, Current mirrors, Active loads, Level shifters and output stages.

Module II: Operational amplifiers

Introduction, open loop and closed loop configuration, op-amp parameters (input offset current, output offset current, i/p bias current, CMRR, PSRR, null adjustment range, etc,) Inverting and non-inverting configuration, voltage gain of inverting and non inverting configurations.

Module III: Linear &Non Linear Wave shaping

Adders, Voltage to current, current to voltage Converter, Integrators, Differentiators**,** Voltage follower (voltage buffer), summer, subtractor, Comparators, log/antilog circuits using Op-amps, precision rectifiers

Module IV: Waveform Generations

Damped and undamped oscillations, Barkhausen criterion for sustained oscillation. Tank circuit generator Astable multi Vibrators, OTA-C Oscillators, Crystal oscillator**.** Types of oscillators: LC-Hartley and Colpitts, RC-RC phase shift and Wien bridge oscillator, Basics of tuned Amplifiers, Voltage Controlled Oscillator.

Module V: Active RC Filters & Applications of Linear Circuits

Idealistic & Realistic response of filters (LP, BP, and HP), Butter worth & Chebyshev approximation filter functions, LP,BP,HP and All pass, Notch Filter, Operational transconductance amplifier (OTA)-C filters.

Module VI: Applications of IC Analog Multiplier & Timer

IC phase locked loops, 555 Timer, IC voltage regulators-(fixed, variable) 78xx, 79xx series and adjustable.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

- Richard C. Jaeger: Microelectronic Circuit Design
- Adel S. Sedra and K. C. Smith: Microelectronic Circuits
- Ramakant Gaekwad: Operational Amplifiers
- Rolf Schaumann and Mac E. Van Valkenburg: Design of Analog Filters
- D. Roy Choudhury and Shail B. Jain: Linear Integrated Circuits

ELECTRIC MACHINES - II

Course Code: BEE 403 **Credit Units: 03**

Course Objective:

This course deals with the systematic study and application of the AC machines which are widely used in the Industry

Course Contents:

Module I: Poly phase Induction Machines – I

Construction features, production of rotating magnetic field, equivalent circuit, torque and power equations, torque-slip characteristics, no load and blocked rotor tests' efficiency. Induction generator, Starting and speed control, cogging and crawling.

Module II: Single- Phase Induction Motor

Double revolving field theory, equivalent circuit, no load and blocked rotor tests, starting methods, repulsion motor.

A.C. Commutator Motor:E.M.F. induced in commutator windings, single phase a.c. series motor, Universal motor

Module III: Synchronous Machines – I

Constructional features, armature windings, E.M.F. equation, winding coefficients, harmonics in the induced E.M.F., armature reaction, O.C. and S.C. tests, voltage regulation-Synchronous impedance method, MMF Method, Potier's triangle method and parallel operation, operation on infinite bus, cooling.

Module IV: Synchronous Machines - II

Two reaction theory, power expressions for cylindrical and salient pole machines, performance characteristics.

Synchronous Motor : Principle of operation, starting methods, phasor diagram torque-angle characteristics, V-curves hunting and dampling, synchronous condenser, reluctance motor.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

Text:

- M.G.Say, "Alternating Current machines", Pitman & Sons.
- P.S. Bimbhra, "Electric Machinery", Khanna Publishers.

References:

- P.S. Bimbhra, "Generalized Theory of Electrical Machnies", Khanna Publishers.
- I.J. Nagrath and D.P. Kothari, "Electrical Machnies", Tata McGraw Hill.
- B.R. Gupta and V. Singhal, "fundamental of Electrical Machines", New Age International

CONTROL SYSTEM

Course Code: BEE 404 **Credit Units: 03**

Course Objective:

The basic objective of this course is to impart to the students, the basic and core knowledge of Linear control system engineering so that the students are able to analyze the linear control systems with the help of time domain and frequency domain tools.

Course Contents:

Module I: Introduction

History and evolution, definition, configuration of a process and control system, classification, open and closed loop systems, merits and demerits, Elements of closed loop systems, importance of feedback, other methods of classification.

Module II: Modelling of Control Systems

Transfer function, block diagram, signal flow graph, Reduction Technique, Mason's Gain Formula. Mathematical modelling and representation of physical systems (Electrical Mechanical and Thermal), derivation of transfer function for different types of systems, Analogous Systems, gear train.

Module III: Time – Domain Analysis

Time domain performance criteria, transient response and steady state response of first, second & higher order systems, steady state errors and static error constants in unity feedback control systems, error criteria, generalized error constants, Sensitivity, Control actions

Module IV: Frequency Domain Analysis

Frequency Domain Analysis frequency domain specifications, Logarithmic plots (Bode Plots), gain and phase margins, relative stability, Correlation with time domain, Polar plots,

Module V: Stability

Stability Concept, Asymptotic stability and conditional stability, Routh – Hurwitz criterion,

Module VI: Methods of Analysis

Bode Plots: Drawing and analyzing, gain and phase margin, stability
Nyquist Criteria: Mapping of contours in s-plane, Nyquist criteria, plots, stability
Root Locus plots: Introduction, concept, procedure and stability.

Module VII: Compensation

Compensation Techniques:Concept of compensation, Lag, Lead and Lag-Lead networks, design of closed loop systems using compensation techniques. P, PI, PID controllers.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

Text:

- R C Dorf,“ Modern Control Systems”, Pearson Education
- J. Nagrath & M. Gopal, 2000, “Control System Engineering”, New Age International.
- Norman S Nise, “Control system Engineering”, Wiley publishers

References:

- M. K. Ogata, 2002, “Modern Control Engineering, PHI.
- B. C. Kuo, 2001, “Automatic Control system, Prentice Hall of India.

POWER PLANT ENGINEERING

Course Code: BEE 405 **Credit Units: 02**

Course Objective:

The objective of the course is to provide a brief knowledge of power plant economics, types of Energy sources and study pf power plants.

Course Contents:

Module I: Introduction

Energy sources, their availability electrical energy demand and growth in India; general state of the energy system; global Energy scenario.

Module II: Power Plant Economics

Types of load; chronological load curves; load duration curve; mass curve; max. Demand; demand factor; load factor; capacity factor; utilization factor; diversity factors; base load and peak load power plants; Capital cost of plants; annual fixed and operating costs of plants; generation cost and depreciation; effect of load factor on unit energy cost; role of load diversity in power system economics; off peak energy utilization; energy cost reduction.

Module III: Tariffs

Objectives of tariffs; general tariff form; flat demand rate; straight meter rate; block meter rate; two part tariffs; power factor dependant tariffs; three parts tariffs; spot (time differentiated) pricing.

Module IV: Conventional Energy Sources

Selection of site; capacity calculations; detailed description and use of different parts; schematic diagram and working of thermal, hydro electric, nuclear power, diesel power and gas turbine power plant.

Module V: non-conventional Energy Sources

Study of wind, solar, tidal, geo-thermal bio-gas sources of energy, fuel cell, magneto hydro dynamic generation system; power crisis; future energy demand; role of private sector in energy management.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text:

- Pratab. H. “Art and Science of Utilization of Electrical Energy”: Dhanpat Rai& Sons, 2001
- Wadhwa C.L. “Generation, Distribution and Utilization of Electrical Power”; Khanna Publications,2005
- Gupta.J. B. “A Course of Electric Power”, S. K. Kataria& Sons, 2009

References:

- Uppal .S. L. “Electrical Power”, Khanna Publisher, 2005
- Dover. A. T. “Electric Traction” , Sir Isaac Pitman & Sons Ltd. 1965
- Taylor Open Shaw “Utilization of Electrical Energy”, ELBS, 1995

DIGITAL CIRCUITS AND SYSTEMS LAB - I

Course Code: BEE 421 **Credit Units: 01**

List of Experiments:

1. To study the op amp as an inverting ,non inverting amplifier, adder, subtract or, integrator and differentiator
2. To design a ramp and a square wave generator.
3. To study the IC-555 timer as stable and bistable multivibrator
4. To design low pass, high pass and band pass filters using op- amp. and plot their frequency response
5. To design various LC & RC oscillators.
6. To design and study class a power amplifier and class B push pull amplifier.
7. To verify the truth tables of NOT, OR, AND, NOR, NAND, XOR, XNOR gates.
8. To obtain half adder, full adder using gates and verify their truth tables.
9. To obtain half subtractor, full subtractor using gates and verify their truth tables.
10. To verify the truth tables of RS, D, JK and T flip- flops.
11. To implement and verify 3-bit bi-directional shift register.
12. To design and study asynchronous/ripple counter.
13. To design and study synchronous counter.
14. To design and study a sequence detector

Examination Scheme:

IA				**EE**	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ANALOG ELECTRONICS – II LAB

Course Code: BEC 422 **Credit Units: 01**

List of Experiments:

1. To studies the various kinds of Printed Circuit Board (PCBs).
2. To study the artwork & drafting for designing of PCB.
3. To study the unregulated power supply & design of adequate circuit diagram.
4. To study the process of manufacturing of PCB.
5. To study the manufacturing & testing of step down transformer of 9V/1A
6. To study soldering of components.
7. To study the regulated power supply & design of adequate circuit diagram

Examination Scheme:

IA				**EE**	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ELECTRICAL MACHINE – IILAB

Course Code: BEE 423 **Credit Units: 01**

List of Experiments:

1. To Perform load-test on 3 ph. Induction motor & to plot torque V/S speed characteristics.
2. To Perform no-load & blocked –rotor tests on 3 ph. Induction motor to obtain equivalent ckt. Parameters & to draw circle diagram.
3. To study the speed control of 3 ph. Induction motor by Kramer's Concept.
4. To study the speed control of 3 ph. Induction motor by cascading of two induction motors, i.e. by feeding the slip power of one motor into the other motor.
5. To study star- delta starters physically and
   (a) to draw electrical connection diagram
   (b) to start the 3 ph. Induction motor using it.
   (c) To reverse the direction of 3 ph. I.M.
6. To start a 3 phase slip –ring induction motor by inserting different levels of resistance in the rotor ckt. And to plot torque –speed characteristics.
7. To perform no-load & blocked –rotor test on 1 ph. Induction motor & to determine the parameters of equivalent ckt. Drawn on the basis of double revolving field theory.
8. To Perform load –test on 1 ph. Induction motor & plot torque –speed characteristics.
9. To Perform no load & short ckt. Test on 3- phase alternator and draw open ckt. And
10. Short ckt. Characteristics.
11. To find voltage regulation of an alternator by zero power factor (z.p.f.) method.
12. To study effect of variation of field current upon the stator current and power factor
13. With synchronous motor running at no load and draw V & inverted V curves of motor.
14. To measure negative sequence & zero sequence reactance of Syn. Machines.

Examination Scheme:

IA				**EE**	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

CONTROL SYSTEM LAB

Course Code: BEE 424 **Credit Units: 01**

Course Contents:

1. Study and draw
   a) Step response of open Loop system (linear 1st order, 2nd order
   b) Step response of closed loop systems (1st order)
2. Study and draw temperature control system the open loop response and closed loop response with different values of gains
3. Study of operations and characteristics of a stepper motor
4. To Study a D.C. motor speed control system.
5. Performance evaluation and design of PID controller.
6. Study of microprocessor control of a simulated linear system.
7. To design a suitable cascade compensator for the given system and verify the resulting improvement.
8. Note: three experiments in MATLAB have to be performed in the slot of MATLAB.
   Using MATLAB, obtain the unit-step response and unit impulse response of the following system:

$$\frac{C(s)}{R(s)} = \frac{16}{s^2 + 1.6s + 16}$$

9. For a 2nd order transfer function using MATLAB
   a) Bode Plot
   b) Root locus plot
   c) Nyquist plot.

Examination Scheme:

IA				**EE**	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ELECTROMAGNETIC FIELD THEORY

Course Code: BEC406 **Credit Units: 03**

Course Objective:

This course provides a general introduction to the important physical concepts and mathematical methods used in treating all types of wave phenomena, but stresses electromagnetic signal propagation and issues of central importance in electrical engineering. As a core course in the Electrical Computer and Systems Engineering option of the Engineering Sciences concentration, it provides essential background and basic preparation for more advanced work in device physics, microwave and ultra-fast circuitry, antenna design, optics, optical communication and optoelectronics.

Course Contents:

Module I:

Mathematical Basics and Electrostatics
Coordinate Systems: Spherical and Cylindrical coordinates, Dirac delta function, Coulomb's law, Gauss's law, Poisson's Equation, Laplace's Equation, Electrostatic Boundary conditions, Work and Energy in Electrostatics, Conductors, Surface charge and force on conductors

Module II:

Magneto statics and Magnetic Fields in matter
Magnetic induction and Faraday's law, Magnetic Flux density, Magnetic Field Intensity, Biot Savart Law, steady currents, Ampere's law, Magneto static Boundary conditions, magnetic field inside matter, magnetic susceptibility and permeability, ferromagnetism, energy stored in a Magnetic field, Magnetic Vector Potential

Module III:

Electrodynamics
Faraday's laws, Maxwell's equations, Maxwell's modification of Ampere's law, continuity equation and Poynting theorem.

Module IV:

Electrodynamic Waves
Wave propagation in unbounded media, Boundary conditions, reflection and transmission, polarization, E.M. waves in vacuum, E. M. waves in matter: reflection and transmission of plane waves.

Module V:

Introduction to Transmission Lines
Transmission Line, Line Parameters, Characteristic Impedance, Image Impedance, HVDC and HVAC Common faults in transmission lines. Skin Effect, Ferranti Effect and Corona.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

- Griffiths: Introduction to Electrodynamics
- Fawwaz T. Ulaby:Fundamentals of Applied Electromagnetics
- Hayt, William H., Buck, John A. Hayt, William H., Buck, John A., Engineering Electromagnetics

COMMUNICATION SKILLS - II

Course Code: BCS 401 **Credit Units: 01**

Course Objective:

To teach the participants strategies for improving academic reading and writing.
Emphasis is placed on increasing fluency, deepening vocabulary, and refining academic language proficiency.

Course Contents:

Module I: Social Communication Skills

Small Talk
Conversational English
Appropriateness
Building rapport

Module II: Context Based Speaking

In general situations
In specific professional situations
Discussion and associated vocabulary
Simulations/Role Play

Module III: Professional Skills

Presentations
Negotiations
Meetings
Telephony Skills

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Essential Telephoning in English, Garside/Garside, Cambridge
- Working in English, Jones, Cambridge
- Business Communication, Raman – Prakash, Oxford
- Speaking Personally, Porter-Ladousse, Cambridge
- Speaking Effectively, Jermy Comfort, et.al, Cambridge
- Business Communication, Raman – Prakash, Oxford

BEHAVIOURAL SCIENCE - IV
(RELATIONSHIP MANAGEMENT)

Course Code: BSS 404 **CreditUnits: 01**

Course Objective:

To understand the basis of interpersonal relationship
To understand various communication style
To learn the strategies for effective interpersonal relationship

Course Contents:

Module I: Understanding Relationships

Importance of relationships
Role and relationships
Maintaining healthy relationships

Module II: Bridging Individual Differences

Understanding individual differences
Bridging differences in Interpersonal Relationship – TA
Communication Styles

Module III: Interpersonal Relationship Development

Importance of Interpersonal Relationships
Interpersonal Relationships Skills
Types of Interpersonal Relationships

Module IV: Theories of Interpersonal Relationships

Theories: Social Exchange, Uncertainty Reduction Theory
Factors Affecting Interpersonal Relationships
Improving Interpersonal Relationships

Module V: Impression Management

Meaning & Components of Impression Management
Impression Management Techniques (Influencing Skills)
Impression Management Training-Self help and Formal approaches

Module VI: End-of-Semester Appraisal

Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Examination Scheme:

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

Text & References:

- Vangelist L. Anita, Mark N. Knapp, Inter Personal Communication and Human Relationships: Third Edition, Allyn and Bacon
- Julia T. Wood. Interpersonal Communication everyday encounter
- Simons, Christine, Naylor, Belinda: Effective Communication for Managers, 1997 1st Edition Cassell
- Goddard, Ken: Informative Writing, 1995 1st Edition, Cassell

- Harvard Business School, Effective Communication: United States of America
- Foster John, Effective Writing Skills: Volume-7, First Edition 2000, Institute of Public Relations (IPR)
- Beebe, Beebe and Redmond; Interpersonal Communication, 1996; Allyn and Bacon Publishers.

FRENCH - IV

Course Code: FLT 401 **Credit Units: 02**

Course Objective:

To enable students:

- To develop strategies of comprehension of texts of different origin
- To present facts, projects, plans with precision

Course Contents:

Module C: pp. 104 – 139: Unités 8, 9

Contenu lexical:Unité 8: Découvrir le passé

1. parler du passé, des habitudes et des changements.
2. parler de la famille, raconter une suite d'événements/préciser leur date et leur durée.
3. connaître quelques moments de l'histoire

Unité 9: Entreprendre

1. faire un projet de la réalisation: (exprimer un besoin, préciser les étapes d'une réalisation)
2. parler d'une entreprise
3. parler du futur

Contenu grammatical:

1. Imparfait
2. Pronom « en »
3. Futur
4. Discours rapporté au présent
5. Passé récent
6. Présent progressif

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- **le livre à suivre : Campus: Tome 1**

GERMAN - IV

Course Code: FLG 401 **Credit Units: 02**

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany.Introduction to Advanced Grammar Language and Professional Jargon

Course Contents:

Module I: Present perfect tense

Present perfect tense, usage and applicability
Usage of this tense to indicate near past
Universal applicability of this tense in German

Module II: Letter writing

To acquaint the students with the form of writing informal letters.

Module III: Interchanging prepositions

Usage of prepositions with both accusative and dative cases
Usage of verbs fixed with prepositions
Emphasizing on the action and position factor

Module IV: Past tense

Introduction to simple past tense
Learning the verb forms in past tense
Making a list of all verbs in the past tense and the participle forms

Module V: Reading a Fairy Tale

Comprehension and narration

- Rotkäppchen
- Froschprinzessin
- Die Fremdsprache

Module VI: Genitive case

Genitive case – Explain the concept of possession in genitive
Mentioning the structure of weak nouns

Module VII: Genitive prepositions

Discuss the genitive propositions and their usage: (während, wegen, statt, trotz)

Module VIII: Picture Description

Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2

SPANISH - IV

Course Code: FLS 401 **Credit Units: 02**

Course Objective:

To enable students acquire working knowledge of the language; to give them vocabulary, grammar, voice modulations/intonations to handle everyday Spanish situations with ease.

Course Contents:

Module I
Revision of earlier semester modules
Introduction to Present Continuous Tense (Gerunds)

Module II
Translation with Present Continuous Tense
Introduction to Gustar, Parecer, Apetecer, doler

Module III
Imperatives (positive and negative commands of regular verbs)

Module IV
Commercial/business vocabulary

Module V
Simple conversation with help of texts and vocabulary
En la recepcion del hotel
En el restaurante
En la agencia de viajes
En la tienda/supermercado

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español Sin Fronteras (Nivel – Elemental)

CHINESE – IV

Course Code: FLC 401 **Credit Units: 02**

Course Objective:

How many characters are there? The early Qing dynasty dictionary included nearly 50,000 characters the vast majority of which were rare accumulated characters over the centuries. An educate person in China can probably recognize around 6000 characters. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I
Dialogue Practice
Observe picture and answer the question
Pronunciation and intonation
Character writing and stroke order.
Electronic items

Module II
Traveling – The Scenery is very beautiful
Weather and climate
Grammar question with – "bu shi …. Ma?"
The construction "yao … le" (Used to indicate that an action is going to take place)
Time words "yiqian", "yiwai" (Before and after).
The adverb "geng".

Module III

Going to a friend house for a visit meeting his family and talking about their customs.
Fallen sick and going to the Doctor, the doctor examines, takes temperature and writes prescription.
Aspect particle "guo" shows that an action has happened some time in the past.
Progressive aspect of an actin "zhengzai" Also the use if "zhe" with it.
To welcome someone and to see off someone …. I cant go the airport to see you off… etc.

Module IV
Shipment. Is this the place to checking luggage?
Basic dialogue on – Where do u work?
Basic dialogue on – This is my address
Basic dialogue on – I understand Chinese
Basic dialogue on – What job do u do?
Basic dialogue on – What time is it now?

Module V
Basic dialogue on – What day (date) is it today?
Basic dialogue on – What is the weather like here.
Basic dialogue on – Do u like Chinese food?
Basic dialogue on – I am planning to go to China.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

"Elementary Chinese Reader, Part-2" Lesson 31-38

MICROPROCESSOR AND MICROCONTROLLER SYSTEMS

Course Code: BEC 501 **Credit Units: 03**

Course Objective:

This course deals with the systematic study of the Architecture and programming issues of 8085-microprocessor family. The aim of this course is to give the students basic knowledge of the above microprocessor needed to develop the systems using it.

Course Contents:

Module I: Introduction to Microcomputer Systems

Introduction to Microprocessors and microcomputers, Study of 8 bit Microprocessor, 8085 pin configuration, Internal Architecture and operations,interrupts, Stacks and subroutines, various data transfer schemes.

Module II: ALP and timing diagrams

Introduction to 8085 instruction set, advance 8085 programming, Addressing modes, Counters and time Delays, Instruction cycle, machine cycle, T-states, timing diagram for 8085 instruction.

Module III: Memory System Design & I/O Interfacing

Memory interfacing with 8085. Interfacing with input/output devices (memory mapped, peripheral I/O), Cache memory system. Study of following peripheral devices 8255, 8253, 8257, 8259, 8251.

Module IV: 8051 Microcontroller and Real time Control

THE 8051 MICROCONTROLLER: Introduction, The 8051 microcontroller hardware, I/O pins, Ports, External memory, Counters and Timers, Serial data,
8051 ASSEMBLY LANGUAGE PROGRAMMING: Addressing modes, External data moves, Stack,Push and Pop opcodes, Logical operations, Byte level and bit level logical operations. Arithmetic operations, Jump and call instructions, Interrupts & returns.

Module V: System Design

Interrupts, Multiple sources of interrupts, Non maskable sources of interrupts, Interrupt structure in 8051,Timers,Free running counter & Real Time control .Serial I/O interface, Parallel I/O ports interface, Digital and Analog interfacing methods, LED array, keyboard, Printer, Flash memory interfacing.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

- Ramesh. S. Gaonkar, "Microprocessor architecture Programming and Application with 8085" Penram International Publishing, 4th Edition
- B.Ram, "Fundamentals of microprocessors and microcomputer" Dhanpat Rai, 5th Edition.] Douglas V Hall.
- M. Rafiquzzaman, "Microprocessor Theory and Application" PHI – 10th Indian Reprint.
- Naresh Grover, "Microprocessor comprehensive studies Architecture, Programming and Interfacing" Dhanpat Rai, 2003.
- Gosh," 0000 to 8085" PHI.

DIGITAL CIRCUITS AND SYSTEMS - II

Course Code: BEC 502 Credit Units: 03

Course Objective:

This course builds on the course Digital Circuits and Systems - Hardware development language VHDL is introduced; the usage of the same to implement the systems is dealt in detail.

Course Contents:

Module I:

Design of Sequential circuits

SR, JK, T and D flip flops and their timing diagrams, characteristic table, characteristic equation and excitation tables. Design of Finite State Machines: Mealy and Moore type using next state tables, state diagrams, state minimization, state encoding: minimum bit change and hot one encodings. Comparative cost and delays of different implementations and their optimization and timing diagrams, Asynchronous and synchronous sequential circuits

Data paths, FSMs with datapaths, ASM charts, synthesis from ASM charts

Module II:

Basics of VHDL

Writing Entities for Digital circuits like decoders, registers etc, Scalar Data types and Operations: Object types: constants, variables, signal and files. Data Types: scalar, integer, floating, physical, enumeration, type declarations, subtypes, expressions and operators for various types.

Sequential statements: If, case, Null, Loop, Exit, Next statements, while loops, For loops, Assertion and report statements

Composite Arrays: arrays, Array aggregates, unconstrained array types, strings, Bit vectors, Standard Logic Arrays, array operations and records

Module III:

VHDL Programming

Behavioural Modeling: process statements, variable and signal assignments, inertial and transport delay models, signal drivers, multiple and postponed processes

Dataflow Modeling: Concurrent signal assignment, multiple drivers, block statement

Structural Modeling: component declaration, component instantiation, resolving signal values, and configuration: basic configuration, configuration for structural modeling, mapping library entities.

Generics, generic (AND, NAND, OR, NOR, XOR and XNOR) gates, functions and subprograms, packages and libraries

Module IV:

Synthesis: mapping statements to gates

Writing a test bench, converting real and integers to time, dumping and reading from text file

Vhdlmodeling of basic gates, half and full adder AOI, IOA, OAI, multiplexes, decoders (dataflow, behavioural and structural modeling), three state driver, parity checker, D, T, JK and SR flip flops, flip flops with preset and clear, modeling for multiplexer, priority encoder, ALU etc, modeling regular structures, delays, conditional operations, synchronous logic, state machine modeling, Moore and Mealy machines, generic priority encoder, clock divider, shift registers, pulse counter etc

Module V:

Overview of the following

PLD devices, PROM, PAL, EPLD, GAL, FPGA, FLGA, DRAM etc and their applications, FPGA programming, Design exercises ASIC design using CAD tools

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
A: Attendance

Text & References:

- Daniel Gajski: Principles of Digital Design
- Bhasker: A VHDL Primer 3/e
- Pedroni: Circuit Design with VHDL
- Perry: VHDL: Programming by examples K. Skahill, VHDL for programmable Logic

MODERN AND DIGITAL CONTROL ENGINEERING

Course Code: BEE 503 **Credit Units: 03**

Course Objective:

The basic objective of the course is to impart knowledge to the students on modern control theory and design of control systems.

Course Contents:

Module I:

Control System Components
Basic components, amplifiers, plants, transducers, error detectors, servo systems and regulator, DC and AC position and speed control systems.

Design of Feedback control systems
Introduction, cascade compensation networks, phase lag and lead design using Bode and Root locus plots

Module II:

Modern theory
Introduction- State variables, state differential equations(homogeneous and non-homogeneous), Solution, state transition matrix- properties and computation, Laplace solution of state equations, transfer function matrix, representation of state equations in term of state transition matrix, characteristic equation

Modeling- state variable modeling, state model signal flow graph, state models-physical, phase, Jordan, similarity transformation, other useful transformation- controllability and observability canonical, diagonal canonical, Jordan canonicalDecomposition- direct, cascade, parallel. Controllability and observability – introduction, definition, tests, theorems, rank of a matrix, output controllability, duality theorem, pole- zero cancellation
Design-state feedback, relationship with closed-loop transfer function, pole placement and assignment, design of controller by transformation, Observer design, Ackerman's formula

Module III:

Discrete time signals and systems
Introduction, SDC systems, sampling and data reconstruction.

Transform analysis of discrete systems: Introduction, linear difference equations, the pulse T.F. and pulse response, Z-transform equivalence of Zdomain to S-domain, stability analysis.

Module IV:

Design of digital controls
Introduction, design of a positional Servomechanism, digital PID controller, multivariable controllers.

Module V:

State space models of discrete time systems: Introduction, discrete time state equation and solution, design examples, concepts of controllability and observability Liapunov stability analysis.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

Text:

- R C Dorf,“ Modern Control Systems”, Pearson Education
- J. Nagrath & M. Gopal, 2000, “Control System Engineering”, New Age International.
- Norman S Nise, “Control system Engineering”, Wiley publishers

References:

- M, K. Ogata, 2002, “Modern Control Engineering, PHI.
- B. C. Kuo, 2001, “Automatic Control system, Prentice Hall of India

MICROPROCESSOR AND MICRO CONTROLLER SYSTEMS LAB

Course Code:BEE 521 **Credit Units: 01**

List of Experiments:

1. To load the numbers 49H and 53H in the memory location 9510 and 9511 respectively and add the contents of memory location 9601.
2. To write assembly language programming for 8 bit addition/subtraction with and without carry/borrow
3. To write assembly language programming for 8 bit multiplication and division.
4. To write assembly language programming for sorting an array of numbers in ascending and descending order.
5. To study and program the programmable peripheral interface (8255) board and programmable interval timer (8253) board.
6. To study and program the programmable DMA controller (8257) board and the programmable. Interrupt controller (8259) board.
7. To study 8086 microprocessor kit.
8. To write a program to move a block of data of 10 numbers from location starting from 2050H to Location starting from 2070H.
9. WAP to solve the equation (AX) + 7(BX) + 9 (DX) $\rightarrow$ SI.
10. To write a subroutine in 8086 assembly language that can be called by a main program in a different code segment. The subroutine call will multiply a signed 16 bit number with an 8 bit number. Store the result in two consecutive memory word and stop. Assume SI and DI point to 8 bit & 16 bit data respectively.
11. To write instructions to check the various flags in the flag register of 8086.
12. To write a program based on arithmetic instructions.
13. To write a program for addition of two 16 - bit numbers. If the result is more than 32
14. Bits then store the result in memory or else out it at peripheral device.
15. To write a program for 8086 involving logical & machine control instructions.

Examination Scheme:

IA				**EE**	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

DIGITAL CIRCUITS AND SYSTEMS – II LAB

Course Code: BEC 522 **CreditUnits: 01**

List of Experiments

To implement VHDL code for

1. 2, 3, 4 inputs AND, OR, XOR and XNOR gates and testing their simulation with signals.
2. Half adder, full adder and full subtractor. Also trying out other simple combinatorial circuits like AOI, IOA, OAI.
3. D and T, flip-flops.
4. JK and SR flip-flops.
5. 2 to 4 and 3 to 8 decoders.
6. 2 to 1, 4 to 1 and 8 to 1 multiplexers.
7. 2 to 1, 4 to 2 and 8 to 3 priority encoders.
8. 8 bit tri state drivers.
9 9 input parity checker.
10 1 bit, 4 bit 8 bit comparators.
11 Adding and subtracting 8 bit integers of various types.
12. Clock divider
13. Shift register
14. Pulse counters.
15. VHDL Design examples of Moore machine, Mealy machine, generic gate inputs and delays.
16. VHDL code examples of structural modeling showing binding.

Experiments based Field Programmable Gate Array (FPGA) Programming

17. Implementation of all the above VHDL experiments using FPGA.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

MATLAB THEORY AND PRACTICES

Course Code: BEE 528 **Credit Units: 01**

Course Objective:

To impart the knowledge on MATLAB software widely used for analysis in Control Systems.

Course Contents:

Module I

Introduction, MATLAB environment- Command, History, Directory, launch pad, Workspace, Array editor and Figure windows

Module II

MATLAB features, variables, keywords, output formats, Help provisions, m-files.

Module III

Input of vectors and matrices, matrix functions, eigen values and eigen vectors, Transfer function and polynomial commands, symbolic math commands and toolbox features

Module IV

MATLAB LTI viewer and Simulink LTI viewer, SISO design tool

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

Text & References:

- Chapman- "MATLAB programming for Engineers", Thomson Learning
- Hanselman and Littlefield- "Mastering MATLAB", Prentice Hall

PRACTICAL TRAINING(EVALUTION)

Course Code: BEE 560 **Credit Units: 06**

Methodology:

Practical training is based on the theoretical subjects studied by students. It can be arranged within the college or in any related industrial unit. The students are to learn various industrial, technical and administrative processes followed in the industry. In case of on-campus training the students will be given specific task of fabrication/assembly/testing/analysis. On completion of the practical training the students are to present a report covering various aspects learnt by them and give a presentation on same.

Examination Scheme:

Feedback from industry/work place	20
Training Report	40
Viva	15
Presentation	25
Total	**100**

COMPUTER SYSTEM ARCHITECTURE

Course Code: BEE 505 **Credit Units: 03**

Course Objective:

This course deals with computer architecture as well as computer organization and design. Computer architecture is concerned with the structure and behaviour of the various functional modules of the computer and how they interact to provide the processing needs of the user. Computer organization is concerned with the way the hardware components are connected together to form a computer system. Computer design is concerned with the development of the hardware for the computer taking into consideration a given set of specifications.

Course Contents:

Module I:

Register Transfer Language
Register Transfer, Bus and Memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic Logic shift Unit.

Module II:

Basic Computer Organizations and Design
Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instructions, Input-Output and Interrupt, Design of Accumulator Logic. Hardwired and Microprogrammed control: Control Memory, Address Sequencing, Design of Control Unit

Module III:

Central Processing Unit
Introduction, General Register Organization, Stack Organization, Instruction representation, Instruction Formats, Instruction type, Addressing Modes, Data Transfer and Manipulation, Program Control, Reduced Instruction Set Computer RISC and CISC
Computer Arithmetic: Introduction, Multiplication Algorithms, Division Algorithms, Floating-Point Arithmetic Operations

Module IV:

Memory and Intrasystem Communication and Input output organization Memory: Memory types and organization Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware

Intrasystem communication and I/O: Peripheral Devices, Input-Output
Controller and I/O driver, IDE for hard disk, I/O port and Bus concept, Bus cycle, Synchronous and asynchronous transfer, Interrupt handling in PC, Parallel Port, RS – 232 interface, Serial port in PC, Serial I/O interface, Universal serial bus IEEE 1394, Bus Arbitration Techniques, Uni-bus and multi-bus architectures EISA Bus, VESA Bus.

Module V:

Pipelining, Vector Processing and Multiprocessors
Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.

Multiprocessors: Characteristics of Multiprocessors, Interconnection Structures, Interprocessor Arbitration, Interprocessor Communication and Synchronization, Advanced computer architecture, Pentium and Pentinum – Pro, Power PC Architecture

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text:

- Morris Mano, Computer System Architecture, 3rd Edition – 1999, Prentice-Hall of India Private Limited.
- Harry & Jordan, Computer Systems Design & Architecture, Edition 2000, Addison Wesley, Delhi.

References:

- WIliam Stallings, Computer Organization and Architecture, 4th Edition-2000, Prentice-Hall of India Private Limited.
- Kai Hwang-McGraw-Hill, Advanced Computer Architecture.
- Kai Hwang & Faye a Briggs, McGrew Hill, inc., Computer Architecture & Parallel Processing.
- John D. Carpinelli, Computer system Organization & Architecture, Edition 2001, Addison Wesley, Delhi
- John P Hayes, McGraw-Hill Inc, Computer Architecture and Organization.
- M. Morris Mano and Charles, Logic and Computer Design Fundamentals, 2nd Edition Updated, Pearson Education, ASIA.
- Hamacher, “Computer Organization,” McGraw hill.
- Tennenbaum,” Structured Computer Organization,” PHI
- B. Ram, “Computer Fundamentals architecture and organization,” New age international Gear C. w., “Computer Organization and Programming, McGraw hill

PROCESS CONTROL ENGINEERING

Course Code: BEE 507 **Credit Units: 03**

Course Objective:

The basic objective of this course is to provide the students the core knowledge of control systems, when applied to specific process control. The idea is provide knowledge about feedback control systems, its design and computer process interface.

Course Contents:

Module I:

Basic Considerations
Introduction to process control system, control loop study- realization with load-changes at arbitrary points in the loop, offset and its analysis, modelling consideration for control purposes, degree of freedom and process controllers, formulating the scope at modelling for process control. Computer simulation and linearization of non linear system transfer function and input output models, Dynamic behaviour of firstorder lag system, process with variable time constant and gain. Dynamic behaviour of second order and higher order system-multicaplacity process, real time process, inverse response process, Introduction to
Feedback control and effects P, I & D controllers.

Module II:

Designing feed back controller
Outline of the design problems, Selection of type of feedback controller. Time-Integral performanceCriterion, Process Reaction Curve and frequency response characteristic, Ziegler-Nichol Rule, effect of dead
time, dead time compensator and inverse response compensator.

Module III:

Control Systems with Multiple Loops
Cascade, spilt-range feed forward, ratio inferential and adaptive control.

Module IV:

Interaction & De-Coupling of Control Loop
Interaction of control loops, relative gain array and selection of the loops, Design of non-interacting control loop.

Module V:

Computer Process Interface for Data Acquisition & Control
Introduction to digital computer control of processes. Design of control system for complete plant.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; A: Attendance

Text & References:

***Text*:**

- Chemical process Control – George Stephanopoulos. Pub. PHI

***References*:**

- Digital Computer Process Control-C.L. Smith Pub: Intext Educational Publisher
- Process Control-F.G. Shinskey, Pub. Mc-Graw Hill
- Advanced Process Control-W.H. Ray, Pub. McGraw Hill
- Process system and analysis and control-D.R. Coushanour, TMH
- Process Instrument & Control handbook-D.M. Considins, Pub: McGraw Hill

COMMUNICATION SKILLS - III

Course Code: BCS 501 **Credit Units: 01**

Course Objective:

To equip the participant with linguistic skills required in the field of science and technology while guiding them to excel in their academic field.

Course Contents:

Module I

Reading Comprehension
Summarising
Paraphrasing

Module II

Essay Writing
Dialogue Report

Module III

Writing Emails
Brochure
Leaflets

Module IV

Introduction to Phonetics
Vowels
Consonants
Accent and Rhythm
Accent Neutralization
Spoken English and Listening Practice

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Effective English for Engineering Students, B Cauveri, Macmillan India
- Creative English for Communication, Krishnaswamy N, Macmillan
- A Textbook of English Phonetics, Balasubramanian T, Macmillan

BEHAVIOURAL SCIENCE - V
(GROUP DYNAMICS AND TEAM BUILDING)

Course Code: BSS 504 **CreditUnits: 01**

Course Objective:

To inculcate in the students an elementary level of understanding of group/team functions
To develop team spirit and to know the importance of working in teams

Course Contents:

Module I:

Group formation
Definition and Characteristics
Importance of groups
Classification of groups
Stages of group formation
Benefits of group formation

Module II:

Group Functions
External Conditions affecting group functioning: Authority, Structure, Org. Resources, Organizational policies etc.
Internal conditions affecting group functioning: Roles, Norms, Conformity, Status, Cohesiveness, Size, Inter group conflict.
Group Cohesiveness and Group Conflict
Adjustment in Groups

Module III:

Teams
Meaning and nature of teams
External and internal factors effecting team
Building Effective Teams
Consensus Building
Collaboration

Module IV:

Leadership
Meaning, Nature and Functions
Self leadership
Leadership styles in organization
Leadership in Teams

Module V:

Power to empower: Individual and Teams
Meaning and Nature
Types of power
Relevance in organization and Society

Module VI:

End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Examination Scheme:

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

- Organizational Behaviour, Davis, K.
- Hoover, Judhith D. Effective Small Group and Team Communication, 2002,Harcourt College Publishers
- Dick, Mc Cann & Margerison, Charles: Team Management, 1992 Edition, viva books
- Bates, A. P. and Julian, J.: Sociology - Understanding Social Behaviour
- Dressers, David and Cans, Donald: The Study of Human Interaction
- Lapiere, Richard. T – Social Change
- Lindzey, G. and Borgatta, E: Sociometric Measurement in the Handbook of Social Psychology, Addison – Welsley, US.
- Rose, G.: Oxford Textbook of Public Health, Vol.4, 1985.
- LaFasto and Larson: When Teams Work Best, 2001, Response Books (Sage), New Delhi
- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company
- Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College Publishers

FRENCH - V

Course Code: FLT 501 **CreditUnits: 02**

Course Objective:

To furnish some basic knowledge of French culture and civilization for understanding an authentic document and information relating to political and administrative life

Course Contents:

Module D: pp. 131 – 156 Unités 10, 11

Contenu lexical: Unité 10: Prendre des décisions

1. Faire des comparaisons
2. décrire un lieu, le temps, les gens, l'ambiance
3. rédiger une carte postale

Unité 11: faire face aux problèmes

1. Exposer un problème.
2. parler de la santé, de la maladie
3. interdire/demander/donner une autorisation
4. connaître la vie politique française

Contenu grammatical:

1. comparatif - comparer des qualités/ quantités/actions
2. supposition : Si + présent, futur
3. adverbe - caractériser une action
4. pronom "Y"

Examination Scheme:

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- **le livre à suivre : Campus: Tome 1**

GERMAN - V

Course Code: FLG 501 **Credit Units: 02**

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany
Introduction to Advanced Grammar and Business Language and Professional Jargon

Course Contents:

Module I:

Genitive case
Genitive case – Explain the concept of possession in genitive
Mentioning the structure of weak nouns

Module II:

Genitive prepositions
Discuss the genitive propositions and their usage: (während, wegen, statt, trotz)

Module III:

Reflexive verbs
Verbs with accusative case
Verbs with dative case
Difference in usage in the two cases

Module IV:

Verbs with fixed prepositions
Verbs with accusative case
Verbs with dative case
Difference in the usage of the two cases

Module V:

Texts
A poem 'Maxi'
A text Rocko

Module VI:

Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH - V

Course Code: FLS 501 **Credit Units: 02**

Course Objective:

To enable students acquire working knowledge of the language; to give them vocabulary, grammar, voice modulations/intonations to handle everyday Spanish situations with ease.

Course Contents:

Module I

Revision of earlier semester modules

Module II

Future Tense

Module III

Presentations in English on
Spanish speaking countries'
Culture
Sports
Food
People
Politics
Society
Geography

Module IV

Situations:
En el hospital
En la comisaria
En la estacion de autobus/tren
En el banco/cambio

Module V

General revision of Spanish language learnt so far.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español Sin Fronteras, Greenfield

CHINESE – V

Course Code:FLC 501 **Credit Units: 02**

Course Objective:

What English words come from Chinese? Some of the more common English words with Chinese roots areginseng, silk, dim sum, fengshui, typhoon, yin and yang, T'al chi, kung-fu. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I

Drills
Dialogue practice
Observe picture and answer the question.
Pronunciation and intonation.
Character writing and stroke order

Module II

Intonation
Chinese foods and tastes – tofu, chowmian, noodle, Beijing duck, rice, sweet, sour….etc. Learning to say phrases like – Chinese food, Western food, delicious, hot and spicy, sour, salty, tasteless, tender, nutritious, god for health, fish, shrimps, vegetables, cholesterol is not high, pizza, milk, vitamins, to be able to cook, to be used to, cook well, once a week, once a month, once a year, twice a week……
Repetition of the grammar and verbs taught in the previous module and making dialogues usingit.
Compliment of degree "de".

Module III

Grammar the complex sentence "suiran … danshi…."
Comparison – It is colder today than it was yesterday…..etc.
The Expression "chule….yiwai". (Besides)
Names of different animals.
Talking about Great Wall of China
Short stories

Module IV

Use of "huozhe" and "haishi"
Is he/she married?
Going for a film with a friend.
Having a meal at the restaurant and ordering a meal.

Module V

Shopping – Talking abut a thing you have bought, how much money you spent on it? How many kinds were there? What did you think of others?
Talking about a day in your life using compliment of degree "de". When you get up? When do you go for class? Do you sleep early or late? How is Chinese? Do you enjoy your life in the hostel?
Making up a dialogue by asking question on the year, month, day and the days of the week and answer them.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- "ElementaryChinese Reader " Part-II Lesson 39-46

POWER ELECTRONICS

Course Code: BEE 601 **Credit Units: 03**

Course Objective:

The course aims to introduce them to the theory of operation, analytical and circuit models and basic design concepts of Electric Power components and systems.

Course Contents:

Module I:

Characteristics of semiconductor power devices
Diode, Thyristor, Triac, GTO, MOSFET, IGBT

Module II:

Triggering Devices
Unijunction Transistor, Characteristics and applications of UJT, Programmable Unijunction Transistor, DIAC, Silicon Controlled Switch, Silicon Unilateral Switch, silicon Silicon bilateral Switch, Shockley diode.

Module III:

Thyristor Firing Circuits, Turn on systems
Two transistor model of Thyristor, Method of Triggering a thyristor, Thyristor Types, Requirement for triggering circuits, Thyristor Firing Circuits, Fullwave control of Ac with one thryristor, Light activated SCrs (LASCR), Control Circuit, dv/dt and di/dt protection of Thyristor, Pulse Transformer triggering, Firing SCR by UJT, TRIAC firing circuit, Phase control of SCR by pedestal and Ramp.

Module IV:

Controlled Rectifiers
Types of Converters, effect of inductive load, Commutating diode or free wheeling diode, controlled rectifiers, Bi phase half wave, single phase full wave phase controlled converter using bridge principle, Issues of line current harmonics, Power factor, Distortion factor of ac to dc converters.

Module V:

Inverters
Types of Inverters, Bridge Inverters, Voltage Source Inverters, Sinusoidal Pulse Width Modulation Inverters, Current source Inverters.

Module VI:

AC Voltage Controllers
Types of AC voltage Controllers, AC Phase Voltage controllers, single Phase Voltage Controller with RL load

Module VII:

DC to DC Converters
DC choppers, Chopper classification, two quadrant chopper, Four quadrant chopper.

Module VIII:

Industrial Applications
One shot Thyristor trigger Circuit, over voltage protection, simple battery charger, battery charging regulator, AC static switches, DC static switch.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

Text:

- J. Michael: Power Electronics: Principles and Applications
- M. H. Rashid: Power Electronics circuits

References:

- H. C. Rai, "Power Electronics Devices, Circuits, Systems and Application", Galgotia, 3rd Ed.
- P. S. Bimbhara, "Electrical Machinery, Theory Performance and Applications" Khanna Publications, 7th Ed

POWER SYSTEM ANALYSIS

Course Code: BEE 602 **Credit Units: 03**

Course Objective :

To provide the knowledge of power system analysis . To blend the students with admittance modelling and impedance modelling and also with the symmetrical components essentials for the power system designing and analysis .

Course Contents :

Module I:

Percent and per unit quantities. Single line diagram for a balanced 3-phase system **Admittance Model:** Branch and node admittances Equivalent admittance network
and calculation of Y bus. Modification of an existing Y bus.

Impendence Model: Bus admittance and impedance matrices. Thevenin's theorem and Z bus. Direct determination of Z bus. Modification of an existing bus.

Module II:

Symmetrical fault Analysis: Transient on a Transmission line, short circuit of a
synchronous machine on no load, short circuit of a loaded synchronous machine. Equivalent circuits of synchronous machine under sub transient, transient and steady state conditions. Selection of circuit breakers, Algorithm for short circuit studies. Analysis of three-phase faults.

Module III:

Symmetrical Components: Fortes cue's theorem, symmetrical component transformation. Phase shift in star-delta transformers. Sequence Impedances of transmission lines, Synchronous Machine and Transformers, zero sequence network of transformers and transmission lines. Construction of sequence networks of power system.

Module IV:

Fault Analysis: Analysis of single line to ground faults using symmetrical components, connection of sequence networks under the fault condition. Unsymmetrical Fault Analysis: (i) Analysis of line-to-line and double line to ground faults using symmetrical components, connection of sequence networks under fault conditions. (ii) Analysis of unsymmetrical shunt faults using bus impedance matrix method.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendanc

Text Books

- J. J. Grainger, William, D. Stevenson Jr.: Power System Analysis, MGH. 2003
- T. K. Nagsarkar & M. S. Sukhija: Power System Analysis, Oxford University Press. 2007

Reference Books

- J. D. Glover, M. S. Sharma & T. J. Overbye: Power System Analysis and Design,

TRANSMISSION AND DISTRIBUTION SYSTEM

Course Code: BEE603 **Credit Units: 03**

Course Objective:

The basic objective of this course is to provide the students the core knowledge of electric power transmission and distribution.

Course Contents:

Module I:

Supply systems: Basic network of power system. Transmission and distribution voltage, effect of system voltage on size of conductor and losses. Comparison of DC 2- wire, DC 3-wire, 1-phase AC and 3-phase AC (3-wire and 4-wire) systems.
Distribution Systems: Primary and secondary distribution systems, feeder, distributor and service mains. Radial and ring- main distribution systems. Kelvin's law for conductor size.

Module II:

Mechanical Features of Overhead Lines: Conductor material and types of conductor. Conductor arrangements and spacing.
Calculation of sag and tension, supports at different levels, effect of wind and ice loading, stringing chart and sag template. Conductor vibrations and vibration dampers.

Module III:

Parameters of Transmission Lines: Resistance inductance and capacitance of overheadlines, effect of earth, line transposition. Geometric mean radius and distance.
Inductance and capacitance of line with symmetrical and unsymmetrical spacing Inductance and capacitance of double circuit lines. Skin and proximity effects. Equivalent circuits and performance of short and medium transmission lines.

Module IV:

Generalized ABCD Line Constants: equivalent circuit and performance of long transmission line. Ferranti effect. Interference with communication circuits. Power flow through a transmission line.
Corona: Electric stress between parallel conductors. Disruptive critical voltage and visual critical voltage, Factors affecting corona. Corona power loss. Effects of corona.

Module V:

Insulators: Pin, shackle, suspension, post and strain insulators. Voltage distribution across an insulator string, grading and methods of improving string efficiency.
Underground Cables: Conductor, insulator, sheathing and armoring materials. Types of cables. Insulator resistance and capacitance calculation. Electrostatic stresses and reduction of maximum stresses. Causes of breakdown. Thermal rating of cable. Introduction to oil filled and gas filled cables.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

- Electric Power System: By – C.L. Wadhwa
- Electric Power System: By - Asfaq Husain
- Elements of Power System Analysis: By – William D. Stevenson
- Power System Analysis & Design: By – B.R. Gupta
- HVDC Transmission: By K.R. Padiyar
- Electric power by Soni, Gupta and Bhatnagar

UTILIZATION OF ELECTRIC POWER

Course Code: BEE 604 **Credit Units: 03**

Course Objective:

This course intends to impart knowledge on the practical and practice aspects of electrical engineering

Course Contents:

Module I: Illumination

Basic laws of illumination; light sources and their characteristics; sources of light; design of lighting schemes; incandescent lamp; sodium lamp; mercury lamp and fluorescent lamp; comparison of various lamps.

Module II: Heating and Welding

Electrical heating-advantages, methods and application, resistance over general construction, design of heating elements, efficiency and losses control. Induction heating: core type furnaces, core less furnaces and high frequency eddy current heating, dielectric heating: principle and special applications, arc furnaces: direct arc furnaces, Indirect arc furnaces, electrodes, power supply and control. Different methods of electrical welding and electrical equipment for them. Arc furnaces transformer and welding transformers.

Module III: Traction

Advantages and disadvantages, system of electric traction, diesel electric locomotives. Mechanics of train movement: simplified speed time curves, average and schedule speed, tractive effort, specific energy consumption, factors affecting specific energy consumption.

Module IV: Traction Motors

DC motors, single phase and three phase motors, starting and control of traction motors, braking of traction motors. Modern 25 KV a.c. single phase traction systems: advantages, equipment and layout of 25 KV, single phase power frequency A.C. traction.

Module V: Electric Drives

Individual and collective drives- electrical braking, plugging, rheostatic and regenerative braking load equalization use of fly wheel criteria for selection of motors for various
industrial drives.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

- Pratab. H. "Art and Science of Utilization of Electrical Energy": Dhanpat Rai & Sons, 2001
- Wadhwa C.L. "Generation, Distribution and Utilization of Electrical Power"; Khanna Publications,2005
- Gupta.J. B. "A Course of Electric Power", S. K. Kataria & Sons, 2009
- Uppal .S. L. "Electrical Power", Khanna Publisher, 2005
- Dover. A. T. "Electric Traction" , Sir Isaac Pitman & Sons Ltd. 1965

POWER ELECTRONICS LAB

Course Code: BEE 621 **Credit Units: 01**

Course Objective:

The course aims to introduce them to the theory of operation, analytical and circuit models and basic design concepts of Electric Power components and systems.

Course Contents:

1. Study of VI Characteristics of SCR at different gate currents.
2. Study of VI characteristics of DIAC.
3. Static characteristics of IGBT and MOSFET
4. RC and UJT triggering of SCR.
5. Different types of commutation..
6. Single phase half and full controlled wave converter.
7. Step up and step down choppers.
8. a. Single phase series inverter.

b. Single phase parallel inverter.

9. Speed control of universal motor.

Examination Scheme:

IA				**EE**	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

Reference/Suggested Books

1. O. P. Arora: Power Electronics Laboratory-Experiments and Organization, Narosa Pub.
2. P. B. Zbar: Industrial Electronics- A Text-Lab Manual, MGH.

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POWER SYSTEM LAB

Course Code: BEE 622 **Credit Units: 01**

List of Experiments:

1. To study the performance of a transmission line. Also compute its ABCD parameters.
2. Study of Characteristics of over current and earth fault protection.
3. To study the operating characteristics of fuse. (HRC or open type)
4. To find the earth resistance using three spikes
5. To study over current static relay.
6. To study the different types of faults on transmission line demonstration panel/model.
7. To study the radial feeder performance when
   (a) Fed at one end.
   (b) Fed at both ends
8. To study the performance of under voltage and over voltage relay.
9. To study the characteristics of bimetal mini circuit breakers.
10. To study the characteristics of Distance Relay.
11. To find the breakdown strength of transformer oil.

Examination Scheme:

IA				**EE**	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

DATA STRUCTURES AND IT

Course Code: BEC 606 **CreditUnits: 03**

Course Objective:

Data structure deals with organizing large amount of data in order to reduce space complexity and time requirement. This course gives knowledge of algorithms, different types of data structures and the estimation space and time complexity.

Course Contents:

Module I: Introduction to Data structures

Data structures: Definition, Types. Algorithm design, Complexity, Time-Space Trade offs. Use of pointers in data structures.Array Definition and Analysis, Representation of Linear Arrays in Memory, Traversing of Linear Arrays, Insertion And Deletion, Single Dimensional Arrays, Two Dimensional Arrays, Multidimensional Arrays, Function Associated with Arrays, Character String in C, Character String Operations, Arrays as parameters, Implementing One Dimensional Array, Sparse matrix.

Module II: Introduction to Stacks and queue

Stack: Definition, Array representation of stacks, Operations Associated with Stacks- Push & Pop, Polish expressions, Conversion of infix to postfix, infix to prefix (and vice versa),Application of stacks recursion, polish expression and their compilation, conversion of infix expression to prefix and postfix expression, Tower of Hanoi problem.

Queue: Definition, Representation of Queues, Operations of queues- QInsert, QDelete, Priority Queues, Circular Queue, Deque.

Module III: Dynamic Data Structure

Linked list: Introduction to Singly linked lists: Representation of linked lists in memory, Traversing, Searching, Insertion into, Deletion from linked list, doubly linked list, circular linked list, generalized list. Applications of Linked List-Polynomial representation using linked list and basic operation. Stack and queue implementation using linked list.

Module IV: Trees and Graphs

Trees: Basic Terminology, Binary Trees and their representation, expression evaluation, Complete Binary trees, extended binary trees, Traversing binary trees, Searching, Insertion and Deletion in binary search trees, General trees, AVL trees, Threaded trees, B trees.

Graphs: Terminology and Representations, Graphs & Multigraphs, Directed Graphs, Sequential representation of graphs, Adjacency matrices, Transversal Connected Component and Spanning trees.

Module V: Sorting and Searching and file structures

Sorting: Insertion Sort, Bubble sort, Selection sort, Quick sort, two-way Merge sort, Heap sort, Partition exchange sort, Shell sort, Sorting on different keys, External sorting.

Searching: Linear search, Binary search

File structures: Physical storage media, File Organization, Linked organization of file, Inverted file, Organization records into blocks, Sequential blocks, Hash function, Indexing & Hashing, Multilevel indexing, Tree Index, Random file, Primary Indices, Secondary Indices, B tree index files.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text:

- Horowitz and Sahani, "Fundamentals of Data structures", Galgotia publications
- Tannenbaum, "Data Structures", PHI
- R.L. Kruse, B.P. Leary, C.L. Tondo, "Data structure and program design in C" PHI
- "Data structures and algorithms" – Schaum Series.
- File Structures An object-Oriented Approach with C++ by Michael J. Folk, Bill Zoellick, Breg Riccardi, Published by Addison Wesley (1st ISE Reprint,1999).

References:

- J. P. Tremblay and P. G. Sorenson, Introduction to Data Structures with Applications, McGraw – Hill Computer Science Series, Mc-Graw – Hill New York, 1984
- Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Published by Prentice-Hall India (1999).
- Data Structures Using C and C++ second edition by Yeddidyah Langsam, Moshe J.Augenstein, Aaron M. Tenen Baum, Published by Prentice-Hall India
- Data Structures and Algorithm analysis in C++ by Mark Allen Weiss, Published by Addison Wesley (3rd Indian Reprint 2000).
- "Data Structures" – R. S. Salaria

SWITCHED MODE POWER SUPPLIES

Course Code: BEE 606 **Credit Units: 03**

Course Objective:

To understand the ability to utilize or specify a modern power processing system more effectively, the user should be familiar with the advantages and limitations of the many techniques available. With this information, the system engineer can specify the power supply requirements so that the most cost-effective and reliable system may be designed to meet these needs. Very often a small change in specification or rearrangement of the power distribution system will allow the power supply designer to produce a much more reliable and cost-effective solution to the user's needs. Hence, to produce the most reliable and cost-effective design, the development of the specification should be an interactive exercise between the power supply designer and the user.

Course Contents:

Module I: Common Requirements: An overview

Introduction, input transient voltage protection, Electromagnetic capability, Start-up methods, soft start, start-up overvoltage prevention, output overvoltage protection, output under voltage protection, output current limiting.

Module II: AC Power line surge protection

Introduction, location categories, likely rate of surge occurrences, surge voltage waveforms, transient suppression devices. Transient protection diodes. Gas filters surge arresters. Line filters Transient suppression combinations, a case study.

Module III: EMI in SMPS

EMI/RFI propagation Modes, Power line filters, Line impedance stabilization networks, line filter design.

Module IV: Fuse Selection

Fuse parameters, types of fuse, selection of fuses, SCR crowbar fuses, Transformer Input Fuses.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

Text:

- Higher Engineering Mathematics by H.K. Dass

References:

- Partial Differential Equations by I. N. Snedon
- Laplace Transformation Schaum outline series
- Advance Engineering Mathematics - Kreszig

Linear Programming – Hadley

COMMUNICATION SKILLS - IV

Course Code: BCS 601 **Credit Units: 01**

Course Objective:

To enhance the skills needed to work in an English-speaking global business environment.

Course Contents:

Module I: Business/Technical Language Development

Advanced Grammar: Syntax, Tenses, Voices
Advanced Vocabulary skills: Jargons, Terminology, Colloquialism
Individualised pronunciation practice

Module II: Social Communication

Building relationships through Communication
Communication, Culture and Context
Entertainment and Communication
Informal business/ Technical Communication

Module III: Business Communication

Reading Business/ Technical press
Listening to Business/ Technical reports (TV, radio)
Researching for Business /Technology

Module IV: Presentations

Planning and getting started
Design and layoutof presentation
Information Packaging
Making the Presentation

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Business Vocabulary in Use: Advanced Mascull, Cambridge
- Business Communication, Raman – Prakash, Oxford
- Business Communications, Rodgers, Cambridge
- Working in English, Jones, Cambridge
- New International Business English, Jones/Alexander, Cambridge

BEHAVIOURAL SCIENCE - VI
(STRESS AND COPING STRATEGIES)

Course Code: BSS 604 **CreditUnits: 01**

Course Objective:

To develop an understanding the concept of stress its causes, symptoms and consequences.
To develop an understanding the consequences of the stress on one's wellness, health, and work performance.

Course Contents:

Module I: Stress

Meaning & Nature
Characteristics
Types of stress

Module II: Stages and Models of Stress

Stages of stress
The physiology of stress
Stimulus-oriented approach.
Response-oriented approach.
The transactional and interact ional model.
Pressure – environment fit model of stress.

Module III: Causes and symptoms of stress

Personal
Organizational
Environmental

Module IV: Consequences of stress

Effect of stress on performance
Individual and Organizational consequences with special focus on health

Module V: Strategies for stress management
Importance of stress management
Healthy and Unhealthy strategies
Peer group and social support
Happiness and well-being

Module VI: End-of-Semester Appraisal

Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Examination Scheme:

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

Text & References:

- Blonna, Richard; Coping with Stress in a Changing World: Second edition
- Pestonjee, D.M, Pareek, Udai, Agarwal Rita; Studies in Stress And its Management
- Pestonjee, D.M.; Stress and Coping: The Indian Experience
- Clegg, Brian; Instant Stress Management – Bring calm to your life now

FRENCH - VI

Course Code: FLT 601 **Credit Units: 02**

Course Objective:

To strengthen the language of the students both in oral and written so that they can:
i) express their sentiments, emotions and opinions, reacting to information, situations;
ii) narrate incidents, events ;
iii) perform certain simple communicative tasks.

Course Contents:

Module D: pp. 157 – 168 – Unité 12

Unité 12: s'évader

1. présenter, caractériser, définir
2. parler de livres, de lectures
3. préparer et organiser un voyage
4. exprimer des sentiments et des opinions
5. téléphoner
6. faire une réservation

Contenu grammatical:

1. proposition relative avec pronom relatif "qui", "que", "où" - pour caractériser
2. faire + verbe

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre : Campus: Tome 1

GERMAN - VI

Course Code: FLG 601 **Credit Units: 02**

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany
Introduction to Advanced Grammar and Business Language and Professional Jargon

Course Contents:

Module I: Adjective endings

Adjective endings in all the four cases discussed so far
Definite and indefinite articles
Cases without article

Module II: Comparative adverbs

Comparative adverbs as and like

Module III: Compound words

To learn the structure of compound words and the correct article which they take
Exploring the possibility of compound words in German

Module IV: Infinitive sentence

Special usage of 'to' sentences called zu+ infinitive sentences

Module V: Texts

A Dialogue: 'Ein schwieriger Gast'
A text: 'Abgeschlossene Vergangenheit'

Module VI: Comprehension texts

Reading and comprehending various texts to consolidate the usage of the constructions learnt so far in this semester.

Module VII: Picture Description

Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH – VI

Course Code: FLS 601 **Credit Units: 02**

Course Objective:

To enable students acquire working knowledge of the language; to give them vocabulary, grammar, voice modulations/intonations to handle everyday Spanish situations in Present as well as in Present Perfect Tense with ease.

Course Contents:

Module I

Revision of the earlier modules

Module II

Present Perfect Tense

Module III

Commands of irregular verbs

Module IV

Expressions with **Tener que** and **Hay que**

Module V

En la embajada
Emergency situations like fire, illness, accident, theft

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras

CHINESE – VI

Course Code: FLC 601 **Credit Units: 02**

Course Objective:

Chinese emperor Qin Shi Huang – Ti who built the great wall of China also built a network of 270 palaces, linked by tunnels, and was so afraid of assassination that he slept in a different palace each night. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I

Drills
Dialogue practice
Observe picture and answer the question.
Pronunciation and intonation.
Character writing and stroke order.

Module II

Going out to see a science exhibition
Going to the theatre.
Train or Plane is behind schedule.
Indian Economy-Chinese Economy
Talking about different Seasons of the Year and Weather conditions. Learning to say phrases like-spring, summer, fall, winter, fairly hot, very cold, very humid, very stuffy, neither hot nor cold, most comfortable, pleasant …. etc.

Module III

Temperature – how to say – What is the temperature in May here?

- How is the weather in summer in your area?
- Around 30 degrees
- Heating, air-conditioning
- Is winter is Shanghai very cold?

Talking about birthdays and where you were born?
The verb "shuo" (speak) saying useful phrases like speak very well, do not speak very well, if speak slowly then understand if speak fast then don't understand, difficult to speak, difficult to write, speak too fast, speak too slow, listen and can understand, listen and cannot understand … etc.
Tell the following in Chinese – My name is …. I was born in … (year). My birthday is …… Today is … (date and day of the week). I go to work (school) everyday. I usually leave home at . (O'clock). In the evening, I usually ……. (do what)? At week end, I ……. On Sundays I usually …… It is today….. It will soon be my younger sisters birthday. She was born in ….. (year). She lives in ……. (where). She is working (or studying)…… where… She lives in …….. (where.)

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Elementary Chinese Reader Part-2, 3; Lesson 47-54

POWER SYSTEM ENGINEERING

Course Code: BEE 701 **Credit Units: 03**

Course Objective :

To blend the knowledge of Power system stability for power system operations and control. Also, to provide knowledge of Economics of power system and load flow analysis.

Course Content:

Module I: Economic Operation of Power Systems:

Introduction, system constraints, optimal operation of power systems. Input output, heat rate and incremental rate curves of thermal generating units.Economic distribution of load between generating units within a plant. Economic distribution of load between power stations, transmission loss equation. Introduction to unit commitment and dynamic programming

Module II: Power System Stability-I:

Power angle equations and power angle curves under
steady state and transient conditions. Rotor dynamics and swing equation (solution of swing equation not included). Synchronizing power coefficient. Introduction to steady state and dynamic stabilities, steady state stability limit.

Module III: Power System Stability-II:

Introduction to transient stability. Equal area criterion and its application to transient stability studies under basic disturbances. Critical clearing angle and critical clearing time. Factors affecting stability and methods to improve stability.

Module IV:Load Flow Analysis:

Load flow problem, development of load flow equations, bus classification Gauss Seidel, Newton Raphosn, decoupled and fast decoupled methods for load flow analysis. Comparison of load flow methods.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Elementary Chinese Reader Part-2, 3; Lesson 47-54

HIGH VOLTAGE ENGINEERING

Course Code: BEE 702 **Credit Units: 03**

Course Objective:

This subject deals with the detailed analysis of Breakdown occur in gaseous, liquids and solid dielectrics. Information about generation and measurement of High voltage and current. In additionthe High voltage testing methods are also discussed.

Course Contents:

Module I: Introduction to High Voltage Technology and Applications

Electric Field Stresses, Gas / Vaccum as Insulator, Liquid Dielectrics, Solids and Composites, Estimation and Control of Electric Stress, Numerical methods for electric field computation, Surge voltages, their distribution and control, Applications of insulating materials in transformers, rotating machines, circuit breakers, cable power Capacitors andbushings.

Module II: Break Down in Gaseous and Liquid Dielectrics

Gases as insulating media, collision process, Ionization process, Townsend's criteria of breakdown in gases, Paschen's law. Liquid as Insulator, pure and commercial liquids, breakdown in pure and commercial liquids.

Module III: Break Down in Solid Dielectrics

Intrinsic breakdown, electromechanical breakdown, thermal breakdown, breakdown of solid dielectrics in practice, Breakdown in composite dielectrics, solid dielectrics used in practice.

Module IV: Generation of High Voltages and Currents

Generation of High Direct Current Voltages, Generation of High alternating voltages, Generation of Impulse Voltages, Generation of Impulse currents, Tripping and control of impulse generators.

Module V: Measurement of High Voltages and Currents

Measurement of High Direct Current voltages, Measurement of High Voltages alternating and impulse, Measurement of High Currents-direct, alternating and Impulse, Oscilloscope for impulse voltage and current measurements.

Module VI: Over Voltage Phenomenon and Insulation Co-Ordination

Natural causes for over voltages – Lightning phenomenon, Overvoltage due to switching surges, system faults and other abnormal conditions, Principles of Insulation Coordination on High voltage and Extra High Voltage power systems.

Module VII: Non-Distructive Testing Of Material and Electrical Apparatus

Measurement of D.C Resistivity, Measurement of Dielectric Constant and loss factor, Partial discharge measurements.

Module VIII: High Voltage Testing Of Electrical Apparatus

Testing of Insulators and bushings, Testing of Isolators and circuit breakers, testing of cables, Testing of Transformers, Testing of Surge Arresters, Radio Interference measurements.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
Att: Attendance

Text & References:

Text:

- High Voltage Engineering by M.S.Naidu and V. Kamaraju – TMH Publications, 3rd Edition
- High Voltage Engineering: Fundamentals by E.Kuffel, W.S.Zaengl, J.Kuffel by Elsevier, 2nd Edition.

References:

- High Voltage Engineering by C.L.Wadhwa, New Age Internationals (P) Limited, 1997.

High Voltage Insulation Engineering by Ravindra Arora, Wolfgang Mosch, New Age International (P)

POWER SYSTEM PROTECTION

Course Code: BEE 703 **Credit Units: 03**

Course Objective:

The basic objective of the course is to impart knowledge to the students on power system protection

Course Contents:

Module I: Neutral Earthing

Introduction, Terms and definition, Disadvantages of ungrounded Systems, Advantages of neutral grounding, Types of grounding, Ungrounded system, Connection of arc suppression coil, Neutral point earthing of transformer LV circuits, Neutral grounding practice, Earthing transformer, Station earthing system, Resonant grounding - Methods of neutral grounding.

Module II: Protective Relaying

Introduction, Importance, Protective zones, primary and backup protection, desirable quantities of protective relaying, Some terms in protective relaying, Basic operation of relay, Classification of relays, Buchholz's relay, Induction relays, Directional relays, Distance relays- impedance relay, admittance relay, classification of distance relays and distance protection, Differential relays

Module III: Static Relays

Introduction, Static relay techniques using semi conductors,: Phase and amplitude comparators, Duality between phase and amplitude comparators, general equation for comparators, Basic elements of a static relay, over-current relays, differential protection, static distance protection

Module IV: Apparatus Protection

Alternator protection- types of faults, Stator protection, differential protection, rotor protection, over load protection, loss of excitation protection, un balanced loading protection, prime mover protection, over speed protection, over voltage protection, Transformer protection-, nature, faults in auxiliary equipment, winding faults, over load and external short circuits, differential protection of transformers, over current and earth fault protection, tank leakage protection, restricted earth fault protection, gas relays, transformer feeder protection, Induction Motor Protection: Abnormal operating conditions, Contactors and circuit breakers for motors, Under voltage protection, phase and Earth fault protection, Overload protection, Unbalanced voltage protection, Single phasing preventer, Phase reversal protection.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester

Text & References:

- Electric Power System: By – C.L.Wadhwa
- Electric Power System: By - Asfaq Husain
- Elements of Power System Analysis: By – William D.Stevenson
- Power System Analysis & Design: By – B.R.Gupta
- HVDC Transmission: By K.R. Padiyar

SUBSTATION ENGINEERING

Course Code: BEE704 **Credit Units: 03**

Course Objective:

The purpose of this course is to provide a thorough introduction to Substation engineering with an in depth study of various components that make a complete Substation.

Course Contents:

Module I

IntroductionFunctions of a substation, Classification, Layout, Design and Construction of Bus Bar and earth wire in substation.
Jumpering of conducters, Factors affecting layout of substation, Testing of substation. Reactive power management, Fundamentals of earthing

Module II

Load Management,Causes and effect of low power factor; advantages of power factor improvement; PF improvement using shunt capacitors and synchronous condensers; calculation of most economic pf when (a) kw demand is constant (b) KVA demand is constant. importance of capacitor banks,

Module III

Computer applications, SCADA subsystem, Data acquisition and data processing, supervisory control , voltage control and voltage stability, Protection using circuit breakers, fuse and protection against overvoltage. Bus bar protection.

Module IV

Technical standards for construction of sub stations, Substation automation system. Gas insulated substations,.

Module V

Air and water pollution by thermal power plants and its control; acid rains; thermal pollution by thermal and nuclear power plants; radio-active pollution of environment by nuclear power plants; noise pollution and noise control; methods suggested to reduce the pollution. pollution flashover mechanism in insulators, basics of current transformers and voltage transformers. Economic operation of power system.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

- Substation Engineering by Er. R.S. Dahiya (KATSON BOOKS)
- EHV AC and DC by S.Rao

POWER SYSTEM ENGINEERING LAB

Course Code: BEE 721 **Credit Units: 01**

Course Objective:

The aim of this course is to make the students learn about the theory and engineering behind load flow and digital techniques in short circuit studies.

Course Contents:

1. Simulate swing equation in simulink (matlab)
2. Economic load dispatch in power system
3. Formation of bus impedance & admittance matrix
4. Simulate simple circuits using circuit breaker.
5. (a) modeling of synchronous machine with pss (b) simulation of synchronous machine With facts device.
6. (a) modeling of synchronous machine with facts device (b) simulation of synchronous Machine with facts devices.
7. Facts controller designs with fact devices for smib system.

Examination Scheme:

IA				**EE**	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

COMMUNICATION SKILLS - V

Course Code: BCS 701 **Credit Units: 01**

Course Objective:

To facilitate the learner with Academic Language Proficiency and make them effective users of functional language to excel in their profession.

Course Contents:

Module I

Introduction to Public Speaking
Business Conversation
Effective Public Speaking
Art of Persuasion

Module II: Speaking for Employment

Types of Interview
Styles of Interview
Facing Interviews-Fundamentals and Practice Session
Conducting Interviews- Fundamentals and Practice Session
Question Answer on Various Dimensions

Module III

Resume Writing
Covering Letters
Interview Follow Up Letters

Module IV: Basic Telephony Skills

Guidelines for Making a Call
Guidelines for Answering a Call

Module V: Work Place Speaking

Negotiations
Participation in Meetings
Keynote Speeches

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Jermy Comfort, Speaking Effectively, et.al, Cambridge
- Krishnaswamy, N, Creative English for Communication, Macmillan
- Raman Prakash, Business Communication, Oxford.

BEHAVIOURAL SCIENCE - VII
(INDIVIDUAL, SOCIETY AND NATION)

Course Code: BSS 704 **CreditUnits: 01**

Course Objective:

This course aims at enabling students towards:
Understand the importance of individual differences
Better understanding of self in relation to society and nation
Facilitation for a meaningful existence and adjustment in society
Inculcating patriotism and national pride

Course Contents:

Module I: Individual differences& Personality

Personality: Definition& Relevance
Importance of nature & nurture in Personality Development
Importance and Recognition of Individual differences in Personality
Accepting and Managing Individual differences (adjustment mechanisms)
Intuition, Judgment, Perception & Sensation (MBTI)
BIG5 Factors

Module II: Managing Diversity

Defining Diversity
Affirmation Action and Managing Diversity
Increasing Diversity in Work Force
Barriers and Challenges in Managing Diversity

Module III: Socialization

Nature of Socialization
Social Interaction
Interaction of Socialization Process
Contributions to Society and Nation

Module IV: Patriotism and National Pride

Sense of pride and patriotism
Importance of discipline and hard work
Integrity and accountability

Module V: Human Rights, Values and Ethics

Meaning and Importance of human rights
Human rights awareness
Values and Ethics- Learning based on project work on Scriptures like- Ramayana, Mahabharata, Gita etc.

Module VI: End-of-Semester Appraisal

Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Examination Scheme:

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

Text & References:

- Davis, K. Organizational Behaviour,
- Bates, A. P. and Julian, J.: Sociology - Understanding Social Behaviour
- Dressler, David and Cans, Donald: The Study of Human Interaction
- Lapiere, Richard. T – Social Change

FRENCH - VII

Course Code: FLT 701 **Credit Units: 02**

Course Objective:

Revise the portion covered in the first volume, give proper orientation in communication and culture.

Course Contents:

Module A: Unités 1 – 3: pp. 06 - 46

Contenu lexical: Unité 1: Rédiger et présenter son curriculum vitae
Exprimer une opinion
Caractériser, mettre en valeur
Parler des rencontres, des lieux, des gens

Unité 2: Imaginer - Faire des projets
Proposer - conseiller
Parler des qualités et des défauts
Faire une demande écrite
Raconter une anecdote
Améliorer son image

Unité 3: Exprimer la volonté et l'obligation
Formuler des souhaits
Exprimer un manque/un besoin
Parler de l'environnement, des animaux, des catastrophes naturelles

Contenu grammatical:

1. Le passé : passé composé/imparfait
2. Pronoms compléments directs/indirects, y/en (idées/choses)
3. Propositons relatives introduites par qui, que, où
4. Comparatif et superlatif
5. Le conditionnel présent
6. Situer dans le temps
7. Féminin des adjectifs
8. La prise de paroles : expressions
9. Le subjonctif : volonté, obligation

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- **le livre à suivre : Campus: Tome 2**

GERMAN - VII

Course Code: FLG 701 **Credit Units: 02**

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany
Introduction to Advanced Grammar and Business Language and Professional Jargon

Course Contents:

Module I: Dass- Sätze

Explain the use of the conjunction "-that", where verb comes at the end of the sentence

Module II: Indirekte Fragesätze

To explain the usage of the "Question Pronoun" as the Relative Pronoun in a Relative Sentence, where again the verb falls in the last place in that sentence.

Module III: Wenn- Sätze

Equivalent to the conditional "If-" sentence in English. Explain that the verb comes at the end of the sentence.

Module IV: Weil- Sätze

Explain the use of the conjunction "because-" and also tell that the verb falls in the last place in the sentence.

Module V: Comprehension texts

Reading and comprehending various texts to consolidate the usage of the constructions learnt so far in this semester.

Module VI: Picture Description

Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant - 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH - VII

Course Code: FLS 701 **Credit Units: 02**

Course Objective:

To enable students acquire working knowledge of the language; to give them vocabulary, grammar, expressions used on telephonic conversation and other situations to handle everyday Spanish situations with ease.

Course Contents:

Module I

Revision of earlier semester modules

Module II

Zodiac signs. More adjectives…to describe situations, state of minds, surroundings, people and places.

Module III

Various expressions used on telephonic conversation (formal and informal)

Module IV

Being able to read newspaper headlines and extracts (Material to be provided by teacher)

Module V

Negative commands (AR ending verbs)

Module VI

Revision of earlier sessions and introduction to negative ER ending commands, introduction to negative IR ending verbs

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español En Directo I A, 1B
- Español Sin Fronteras
- Material provided by the teacher from various sources

CHINESE – VII

Course Code: FLC 701 **Credit Units: 02**

Course Objective:

The story of Cinderella first appears in a Chinese book written between 850 and 860 A.D. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I

Drills
Dialogue practice
Observe picture and answer the question.
About china part –I Lesson 1, 2.

Module II

Pronunciation and intonation
Character Writing and stroke order.

Module III

Ask someone what he/she usually does on weekends?
Visiting people, Party, Meeting, After work….etc.

Module IV

Conversation practice
Translation from English to Chinese and vise-versa.
Short fables.

Module V

A brief summary of grammar.
The optative verb "yuanyi".
The pronoun "ziji".

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- "Kan tu shuo hua" Part-I Lesson 1-7

ELECTRICAL DRIVE AND CONTROL

Course Code: BEE 801 **Credit Units: 03**

Course Objective :

The course is aiming to give a thorough understanding of converter topologies and control principles used in modern electrical motor drives**.**

Course Contents:

Module I: Dynamics of Electric Drives:

Fundamental torque equations, speed-torque conventions and multi-quadrant operation, Nature and classification of load torques, steadystate stability, load equalization, close loop configurations of drives.

Module II: DC Drives:

Speed torque curves, torque and power limitation in armature voltage and field control, Starting, Braking: Regenerative Braking, dynamic braking and plugging. Speed Control-Controlled Rectifier fed DC drives, Chopper Controlled DC drives.

Module III: Induction Motor Drives :

Starting, Braking- Regenerative braking, plugging and dynamic braking.

Speed Control: Stator voltage control, variable frequency control from voltage source, Voltage Source Inverter (VSI) Control. Cycloconverter Control, Static rotor resistance control, Slip Power Recovery- Stator Scherbius drive, Static Kramer drive.

Module IV:Synchronous Motor Drive:

Control of Synchronous Motor-Separately Controlled and VSI fed Self-Controlled Synchronous Motor Drives.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
A: Attendance

Text Books

- G. K. Dubey: Fundamentals of Electrical Drives, Narosa Publishing House, New Delhi. 2002
- B. K. Bose: Power Electronics and Motor Drives, Elsevier. 2010

Reference Books

- V. Subrahmanyam: Electric Drives- Concepts and Applications, MGH. 2011
- Theodore Wildi: Electrical Machines, Drives and Power Systems, Pearson 2007
- S. K. Pillai: A First Course on Electrical Drives, Wiley Eastern limited, India. 1989

FLEXIBLE AC TRANSMISSION SYSTEMS

Course Code: BEE 802 **Credit Units: 03**

Course Objective:

The course gives an opportunity to attendees to understand more fully the technicalities of steady state, dynamic and transient stability and to be fully aware of the types and functionality of equipment available today in the FACTS artillery.

Course Contents:

Module 1 : Introduction

Basics of Power Transmission networks, control of power flow in AC Transmission line, Flexible AC transmission system controllers Application of FACTS controllers in distribution systems.

Module 2: AC Transmission line and Reactive Power compensation

Analysis of Uncompensated AC line, Passive Reactive Power Compensations, Compensation by a Series Capacitor Connected at the Mid- point of the Line, Shunt Compensation Connected at
the Midpoint of the Line, Comparison between Series and Shunt Capacitor and SSSC.

Module 3: Static Var Compensator

Static Var Compensator, Analysis of SVC, Configuration of SVC, SVC Controller, Harmonics and Filtering, Applications of SVC**.**

Module 4: Static Synchronous Compensator (STATCOM)

Introduction**,** Principle of Operation of STATCOM, Simplified Analysis of a Three Phase Six Pulse STATCOM, Analysis of a Six Pulse VSC Using Switching Functions, Harmonic Transfer and Resonance in VSC, Applications of STATCOM, Compensation by STATCOM.

Module 5: Unified Power Flow Controller and other Multi-Converter Devices

Introduction, Operation of a UPFC, Control of UPFC, Protection of UPFC, Interline Power Flow Controller, Convertible Static Compensator, SSR Characteristics of UPFC, Applications of UPFC.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
A: Attendance

Text & References:

- K. R. Padiyar: Flexible AC Transmission Systems, 2009

MAJOR PROJECT

Course Code: BEE 860 **Credit Units: 12**

Methodology

Topics of project are to be based on the latest trends, verifying engineering concepts /principals and should involve elementary research work. The projects may involve design, fabrications, testing, computer modelling, and analysis of any engineering problem. On completion of the practical training the students are to present a report covering various aspects learnt by them and give a presentation on same.

Examination Scheme:

Literature study/ Fabrication/ Experimentation	40
Written Report	20
Viva	15
Presentation	25
Total	**100**

OPTIMIZATION TECHNIQUES AND ALGORITHMS

Course Code: BEE 803 **Credit Units: 03**

Course Objective:

To impart the knowledge of optimization techniques used in the industries and research projects for product development and applications.

Course Contents:

Module I: **Introduction**

Engineering application of Optimization, Formulation of designproblems as mathematical programming problems, classification of optimization problems.

Module II : optimization techniques

Classical optimization, multivariable with no constraints,unconstrained minimization techniques,Penalty function techniques, Lagrange multipliers and feasibility techniques.

ModuleIII: Linear Programming

Graphical method, Simplex method, Duality in linearprogramming (LP), Sensitivity analysis, Applications in civil engineering.

ModuleIV: Non Linear Programming Techniques/Method

Unconstrained optimization,one dimensional minimization, golden section, elimination, quadratic and cubic, Fibonacci, interpolationDirect search, Descent, Constrained optimization, Direct and indirect, Optimization with calculus, Khun-Tucker conditions.

Module V:**Constrained Optimization Techniques**

Direct, complex, cutting plane, exterior Penalty function methods for structural engineering problems.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
A: Attendance

Text Books

- Rao S. S.: Engineering Optimization- Theory and Practice, New Age International. 2009
- Hadley. G.: Linear programming, Narosa Publishing House, New Delhi. 2003

Reference Books

- Deb. K.: Optimization for Engineering Design_ Algorithms and Examples, PHI. 2012

- Bhavikatti S. S.: Structural Optimization Using Sequential Linear Programming, Vikas Publishing House, New Delhi. 2003

- Spunt: Optimum Structural Design, Prentice Hall. 1971

SMART GRID TECHNOLOGY

Course Code: BEE 804 **Credit Units: 03**

Course Objective:

The course discusses the international and national development towards the futures renewable electric energy system, and the concept known as Smart Grid. The starting point is the understanding of how design, operation and control of power systems traditionally have been considered. Integration of distributed and intermittent renewable energy requires a new paradigm, and the course gives a basis to understand and contribute to this development. Power systems, power electronics and renewable energy merge, for example in micro grids. A major part of the course concerns electric energy production with photovoltaic (solar) cells. The solar resource and photovoltaic materials and their electrical characteristics are discussed, followed by the treatment of photovoltaic systems, including economic considerations and energy storage. Also other renewable resources are mentioned. In addition, the course discusses the interaction between the power grid and flexible resources, and smart meters.

Course Contents:

Module I: Introduction to Smart Grid:

Evolution of Electric Grid, Concept, Definitions and Need for Smart Grid, Smart grid drivers, functions, opportunities, challenges and Benefits Difference between conventional & Smart Grid, Concept of Resilient &Self-Healing Grid, Present development & International policies in Smart Grid, Diverse perspectives from experts and global Smart Grid initiatives.

Module II: Smart Grid Technologies:

Technology Drivers, Smart energy resources, Smart substations, Substation Automation, Feeder Automation ,Transmission systems: EMS, FACTS and HVDC, Wide area monitoring,

Protection and Control, Distribution Systems: DMS, Volt/Var control, Fault Detection, Isolation and service restoration, Outage management, High-Efficiency Distribution Transformers, Phase Shifting Transformers, Plug in Hybrid Electric Vehicles (PHEV).

Module III: Smart Meters and Advanced Metering Infrastructure:

Introduction to Smart Meters, Advanced Metering infrastructure (AMI) drivers and benefits, AMIprotocols, standards and initiatives, AMI needs in the smart grid, Phasor Measurement, Unit (PMU), Intelligent\ Electronic Devices (IED) & their application for monitoring & protection.

Module IV: Power Quality Management in Smart Grid:

Power Quality & EMC in Smart Grid, Power Quality issues of Grid connected Renewable Energy Sources, Power Quality Conditioners for Smart Grid, Web based Power Quality monitoring, Power Quality Audit.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;
A: Attendance

Text and References:

Text:

- Vehbi C. Güngör, Dilan Sahin, Taskin Kocak, Salih Ergüt, Concettina Buccella,Carlo Cecati, and Gerhard P. Hancke: Smart Grid Technologies- CommunicationTechnologies and Standards IEEE Transactions on Industrial Informatics, Vol. 7, No.4, November 2011.

- Xi Fang, Satyajayant Misra, Guoliang Xue, and Dejun Yang: Smart Grid – The Newand Improved Power Grid- A Survey, IEEE Transaction on Smart Grids, 2011

Reference:

- Stuart Borlase: Smart Grid-Infrastructure, Technology and Solutions, CRC Press 2012